

14. Terrestrial Biological Resources

14.1 Introduction

This chapter describes the terrestrial biological resources setting for the Extended, Secondary, and Primary study areas. Descriptions and maps of these three study areas are provided in Chapter 1 Introduction. Terrestrial biological resources include wildlife habitats and their associated invertebrates, reptiles, amphibians, birds, and mammals. Wildlife habitat descriptions focus on the value of the vegetation community to wildlife, rather than on the plant species that comprise the habitat type. For more detailed descriptions of vegetation communities, refer to Chapter 13 Botanical Resources.

The regulatory setting for terrestrial biological resources is discussed briefly in this chapter, and is presented in greater detail in Chapter 4 Environmental Compliance and Permit Summary.

This chapter focuses primarily on the Primary Study Area. Potential impacts in the Secondary and Extended study areas were evaluated and discussed qualitatively. Potential local and regional impacts from constructing, operating, and maintaining the alternatives were described and compared to applicable significance thresholds. Mitigation measures are provided for identified significant or potentially significant impacts, where appropriate.

14.2 Environmental Setting/Affected Environment

14.2.1 Extended Study Area

14.2.1.1 Methodology

Wildlife Habitats and Associated Wildlife

California Department of Fish and Game's (DFG's) California Wildlife Habitat Relationships (WHR) System (DFG, 2008a) was used to identify the potential number of species that could exist within the Extended Study Area. WHR is a predictive model that relates the suitability of each of California's habitat types to individual wildlife species based on their reproductive, cover, and feeding requirements. For the WHR analysis of the contracted municipal, industrial, and agricultural water deliveries within the Extended Study Area, only the urban and agricultural habitat types were considered. WHR separates agriculture into crop types. The crops that could be affected by a more reliable water source are rice, irrigated grain crops, irrigated row and field crops, irrigated hayfields, evergreen orchard, deciduous orchard, pasture, and vineyard.

A WHR species list was generated for each habitat type listed above based on their occurrence within the 39 counties of the CVP and SWP service areas. Because only ten counties can be entered into the WHR System at one time, 4 species lists were generated and then merged for each habitat type. The habitat types listed above may not occur in every county within the Extended Study Area.

For the analysis of wildlife refuges and wildlife areas (WAs) that receive Level 4 water deliveries within the Extended Study Area¹, a WHR species list was generated for fresh emergent wetland habitat based on its occurrence within 7 counties (Colusa, Fresno, Glenn, Kern, Kings, Merced, and Tulare).

¹The Level 4 water deliveries that could be affected by Project operation are contracted to the Sacramento and Colusa NWRs within the Sacramento River Basin; to the West Bear Creek unit of the San Luis NWR Complex and the Merced unit of the Merced NWR, as well as the Los Banos, Volta, and Mendota WAs, the China Island and Salt Slough units of the North Grasslands WA, and private wetlands of the Grassland Resource Conservation District within the San Joaquin River Basin; and to the Kern and Pixley NWRs within the Tulare Lake Basin.

For the analysis of wildlife that occur within San Luis Reservoir, a WHR species list was generated for lacustrine habitat based on its occurrence in Merced County.

Special-Status Wildlife Species

A list of special-status wildlife species that may occur within the service areas of the Extended Study Area was generated using the Sacramento U.S. Fish and Wildlife Service (USFWS) Office's Endangered Species Program website (USFWS, 2009a). The list includes federal endangered, threatened, and candidate species that may be affected within 28 of the 39 counties of the Extended Study Area that are within its jurisdiction, as well as areas of designated critical habitat. Critical habitat is habitat that is essential to the conservation of the species and is protected pursuant to the federal Endangered Species Act (FESA). The USFWS' Endangered Species Database (TESS) was used to generate species lists for Monterey, San Benito, Santa Barbara, Santa Cruz, and Ventura counties (USFWS, 2009b). The Carlsbad Fish and Wildlife Office's website was used to access a list of species by county within its jurisdiction, which includes Imperial, Los Angeles, Orange, Riverside, San Bernardino, and San Diego counties (USFWS, 2009c).

A list of special-status wildlife species was also generated using the Sacramento Fish and Wildlife Office's Endangered Species Program website (USFWS, 2009a) for the four USGS 7.5 minute quadrangles within which San Luis Reservoir is located (map numbers are provided in parentheses): Los Banos Valley (384A), Mariposa Peak (384B), Pacheco Pass (404C), and San Luis Dam (404D).

The California Natural Diversity Database (CNDDDB) *State and Federally Listed Endangered and Threatened Animals of California* (October, 2009) and *Special Animals* (July, 2009) lists were also consulted for State-listed species and species of special concern (DFG, 2009a).

Commercially or Recreationally Important Wildlife Species

The agricultural lands and wildlife refuges within the Extended Study Area provide seasonal and year-round habitat for a variety of commercially or recreationally important wildlife species. The WHR System (DFG, 2008a) was used to generate a list of all harvest (hunted or trapped) species that could occur within the rice, irrigated grain crops, irrigated row and field crops, irrigated hayfields, evergreen orchard, deciduous orchard, pasture, and vineyard habitats within the 39 counties that comprise the Extended Study Area. Because only ten counties can be entered into the WHR System at one time, four species lists were generated and then merged for each habitat type. A separate list was generated for all harvest species that could occur within fresh emergent wetland habitat within the counties that are in the Extended Study Area wildlife refuges and areas (Colusa, Fresno, Glenn, Kern, Kings, Merced, and Tulare). Finally, a list of harvest species that could occur within the lacustrine habitat of San Luis Reservoir was generated for Merced County.

14.2.1.2 Wildlife Habitats and Associated Wildlife

Urban

Urban habitat includes vegetation in city parks, tree strips along city streets, residential gardens, and landscaping, such as shrubs, shade trees, and lawns. Vegetation in urban habitat is comprised of native and non-native species that usually receive some level of maintenance. The species found in urban habitat are greatly influenced by the type of habitat that is adjacent to the urban area; most large cities are surrounded by agricultural and grazing lands. Many non-native wildlife species thrive in urban areas (Mayer and Laudenslayer, 1988a).

Up to 225 species (170 birds, 43 mammals, 8 reptiles, and 4 amphibians) may be found within this habitat type within the Extended Study Area (DFG, 2008a). Wildlife species commonly associated with urban habitat include the Virginia opossum (*Didelphis virginiana*), Brazilian free-tailed bat (*Tadarida brasiliensis*), California ground squirrel (*Spermophilus beecheyi*), Botta's pocket gopher (*Thomomys bottae*), house mouse (*Mus musculus*), striped skunk (*Mephitis mephitis*), western fence lizard (*Sceloporus occidentalis*), pacific chorus frog (*Pseudacris egilla*), rock pigeon (*Columba livia*), numerous hummingbird species, western scrub jay (*Aphelocoma californica*), yellow-billed magpie (*Pica nuttalli*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), house finch (*Carpodacus mexicanus*), house sparrow (*Passer domesticus*), and American robin (*Turdus migratorius*).

Rice

Rice is a flood-irrigated annual crop that is usually planted in the spring and harvested in the fall. Rice is typically grown in leveed fields that have heavier clay soils that hold water well – many rice field locations historically supported seasonal wetlands. Flooded rice fields support many species that were once supported by wetlands, and some waterfowl species depend on waste rice (Mayer and Laudenslayer, 1988a).

Up to 196 species (137 birds, 33 mammals, 20 reptiles, and 6 amphibians) may be found within this habitat type within the Extended Study Area (DFG, 2008a). Wildlife species commonly associated with rice habitat include the ring-necked pheasant (*Phasianus colchicus*), sandhill crane (*Grus canadensis*), greater white-fronted goose (*Anser albitrons*), common muskrat (*Ondatra zibethicus*), numerous waterfowl species, herons, egrets, and the giant garter snake (*Thamnophis gigas*).

Irrigated Grain Crops

Irrigated grain and seed crops include corn, safflower, dry beans, milo, grain sorghum, and sunflowers. These crops are annuals that are typically planted in the spring and harvested in the summer or fall. Wheat and barley are also irrigated grain crops, but are typically planted in the fall and harvested in the spring. Approximately 50 percent of all barley crops and 75 percent of wheat crops are irrigated. Irrigated grain and seed crops are established on very fertile soils, which historically supported native vegetation that provided high habitat suitability and an associated abundance of wildlife. Irrigated grain and seed crops do not support that same abundance of wildlife, but several species have adapted to this habitat type, and some species depend on the waste grain that remains in the field after harvesting (Mayer and Laudenslayer, 1988a).

Up to 173 species (108 birds, 53 mammals, 5 reptiles, and 7 amphibians) may be found within this habitat type within the Extended Study Area (DFG, 2008a). Wildlife species commonly associated with irrigated grain and seed crops include the black rat (*Rattus rattus*), Botta's pocket gopher, wild pig (*Sus scrofa*), mule deer (*Odocoileus hemionus*), gopher snake (*Pituophis catenifer*), greater white-fronted goose, Canada goose (*Branta canadensis*), mallard (*Anas platyrhynchos*), northern harrier (*Circus cyaneus*), ring-necked pheasant, killdeer (*Charadrius vociferus*), barn owl (*Tyto alba*), tri-colored blackbird (*Agelaius tricolor*), herons, egrets, and numerous bat species.

Irrigated Row and Field Crops

Irrigated row and field crops include cotton, asparagus, strawberries, tomatoes, lettuce, melons, broccoli, cauliflower, carrots, celery, cucumber, potatoes, and onions. Most of these crops are annual, but some, such as asparagus and strawberries, are perennial. Similar to irrigated grain and seed crops, most row and

field crops are planted on very fertile soils and do not support the abundance of wildlife that the historical native vegetation once supported (Mayer and Laudenslayer, 1988a).

Up to 116 species (46 birds, 51 mammals, 10 reptiles, and 9 amphibians) may be found within this habitat type within the Extended Study Area (DFG, 2008a). Wildlife species commonly associated with irrigated row and field crops include the black-tailed jackrabbit (*Lepus californicus*), California ground squirrel, Botta's pocket gopher, western harvest mouse (*Reithrodontomys megalotis*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), snow goose (*Chen caerulescens*), ring-necked pheasant, killdeer, barn owl, red-winged blackbird (*Agelaius phoeniceus*), and numerous bat species.

Irrigated Hayfield

Irrigated hayfields include alfalfa fields and grass hayfields. Alfalfa fields are plowed every three to six years, with some fields plowed every year. Within the Central Valley, alfalfa fields can be harvested as many as 6 times per year. Alfalfa fields are an important part of a crop rotation, because alfalfa renews soil nitrogen. Grass hayfields are intensively mowed and managed fields of annually-planted introduced grasses, or can also be naturally-occurring perennial grasses and sedges. A mixture of these grass types is common. This habitat provides a high quality seasonal resource for many wildlife species, but frequent harvesting makes this habitat type unsuitable for ground nesting species (Mayer and Laudenslayer, 1988a).

Up to 223 species (158 birds, 58 mammals, 6 reptiles, and 1 amphibian) may be found within this habitat type within the Extended Study Area (DFG, 2008a). Wildlife species commonly associated with irrigated hayfields include the great blue heron, great egret, cattle egret (*Bubulcus ibis*), tundra swan (*Cygnus columbianus*), several goose species, mallard, northern pintail (*Anas acuta*), northern harrier, ring-necked pheasant, sandhill crane, long-billed curlew (*Numenius americanus*), burrowing owl (*Athene cunicularia*), red-winged blackbird, Botta's pocket gopher, and gopher snake.

Evergreen Orchard

Evergreen orchards are single species tree-dominated habitats in which the trees are arranged in a linear pattern and are spaced evenly. Understory species may include low-growing grasses or other herbaceous plants, but evergreen orchards are typically managed to prevent any understory growth. Evergreen orchards include avocados, dates, grapefruit, lemons, limes, olives, oranges, tangerines, and tangelos. Evergreen orchards are planted on fertile soil that once supported diverse habitats and numerous wildlife species. This heavily managed monoculture does not support the abundance of wildlife once associated with the native vegetation, but some species have adapted and have become pests by feeding on the leaves and fruit of the trees. Other wildlife species use evergreen orchards for cover and nesting sites, with the year-round tree canopy providing shelter from hot or cold temperatures (Mayer and Laudenslayer, 1988a).

Up to 90 species (30 birds, 45 mammals, 9 reptiles, and 6 amphibians) may be found within this habitat type within the Extended Study Area (DFG, 2008a). Wildlife species commonly associated with evergreen orchards include the mourning dove (*Zenaida macroura*), California quail (*Callipepla californica*), barn owl, European starling, western gray squirrel (*Sciurus griseus*), Botta's pocket gopher, black-tailed jackrabbit, and mule deer.

Deciduous Orchard

Similar to evergreen orchards, deciduous orchards are single species tree-dominated habitats in which the trees are arranged in a linear pattern and are spaced evenly. Understory species may include low-growing

grasses or other herbaceous plants, but some deciduous orchards are managed to prevent any understory growth. Deciduous orchards include almonds, apples, apricots, cherries, figs, nectarines, peaches, pears, pecans, pistachios, plums, prunes, and walnuts. The tree canopy can provide shelter from heat, but does not provide much cover from rain and cold during the winter after the leaves have dropped (Mayer and Laudenslayer, 1988a).

Up to 167 species (107 birds, 48 mammals, 9 reptiles, and 3 amphibians) may be found within this habitat type within the Extended Study Area (DFG, 2008a). Wildlife species commonly associated with deciduous orchards include the northern flicker (*Colaptes auratus*), western scrub jay, American crow (*Corvus brachyrhynchos*), oak titmouse (*Baeolophus inornatus*), Brewer's blackbird (*Euphagus cyanocephalus*), American robin, western gray squirrel, California ground squirrel, raccoon (*Procyon lotor*), and black bear (*Ursus americanus*).

Pasture

Pasture habitat is a mix of perennial grasses and legumes that is irrigated and used for grazing livestock. The height of the vegetation depends on management practices, the type of livestock, stocking rates, and grazing duration. Pasture is typically planted on soils that are not suitable for other crops. Ground-nesting birds will nest in pasture habitat when adequate vegetation is present at the start of the nesting season, and flood-irrigated pasture provides feeding and roosting sites for shorebirds, wading birds, and waterfowl. Large mammals, such as deer, antelope, and elk will graze pastures if adjacent escape cover exists (Mayer and Laudenslayer, 1988a).

Up to 108 species (9 birds, 69 mammals, 13 reptiles, and 17 amphibians) may be found within this habitat type within the Extended Study Area (DFG, 2008a). Wildlife species commonly associated with pasture include the bullfrog (*Rana catesbeiana*), burrowing owl, broad-footed mole (*Scapanus latimanus*), black-tailed jackrabbit, California ground squirrel, Botta's pocket gopher, San Joaquin pocket mouse (*Perognathus inornatus*), pronghorn (*Antilocapra americana*), and gopher snake.

Vineyard

Vineyards are composed of a single species planted in rows, with the vines supported by a trellis. The area beneath the vines is usually managed to prevent plant growth, but the area between rows is typically planted with grasses or other herbaceous plants. Vineyards include boysenberries, raspberries, kiwifruit, and grapes. Vineyards are planted on highly fertile soils that once supported diverse native habitats which, in turn, supported an abundance and diversity of wildlife. Some wildlife have adapted to vineyards by browsing on the vines, eating the fruit, or using the habitat for nesting and cover. Raptors use vineyards to feed on rodents and other crop pests (Mayer and Laudenslayer, 1988a).

Up to 105 species (43 birds, 46 mammals, 10 reptiles, and 6 amphibians) may be found within this habitat type within the Extended Study Area (DFG, 2008a). Wildlife species commonly associated with vineyards include the mule deer, black-tailed jackrabbit, California ground squirrel, mourning dove, barn owl, northern mockingbird, Brewer's blackbird, house finch, Botta's pocket gopher, and American kestrel (*Falco sparverius*).

Fresh Emergent Wetland

Fresh emergent wetlands are one of the most productive wildlife habitats in California. Located in land depressions, these wetlands are flooded frequently and are dominated by rooted perennial vegetation, such as cattail (*Typha* sp.), bulrush (*Scirpus* sp.), and arrowhead (*Sagittaria* sp.). The wetlands of the wildlife refuges and WAs are primarily managed to provide wintering habitat for waterfowl, but many

other species benefit from their management practices, including special-status species that depend on ponded water for all or part of their life cycles (Mayer and Laudenslayer, 1988a).

Up to 180 species (119 birds, 32 mammals, 12 reptiles, and 17 amphibians) may be found within this habitat type within the wildlife refuges and WAs in the Extended Study Area (DFG, 2008a). Wildlife species commonly associated with fresh emergent wetland include the California newt (*Taricha torosa*), western spadefoot (*Spea hammondi*), Pacific chorus frog, California red-legged frog (*Rana draytonii*), eared grebe (*Podiceps nigricollis*), black-crowned night heron (*Nycticorax nycticorax*), Canada goose, mallard, northern shoveler (*Anas clypeata*), sandhill crane, white-faced ibis (*Plegadis chihi*), short-eared owl (*Asio flammeus*), red-winged blackbird, American beaver (*Castor canadensis*), common muskrat, American mink (*Mustela vison*), raccoon, western pond turtle (*Actinemys marmorata*), and giant garter snake.

Lacustrine

Lacustrine habitat includes permanently flooded lakes and reservoirs, intermittent lakes, and ponds – some of which may be shallow enough to support rooted plants (Mayer and Laudenslayer, 1988a). Operations at San Luis Reservoir cause severe reservoir level fluctuations, but the fluctuations are gradual enough to support some wetland and riparian scrub vegetation species in seeps within the drawdown zone.

Up to 130 species (103 birds, 14 mammals, 5 reptiles, and 8 amphibians) may be found within this habitat type within Merced County at San Luis Reservoir (DFG, 2008a). Wildlife species commonly associated with lacustrine open-water habitat include the bald eagle (*Haliaeetus leucocephalus*), western grebe (*Aechmophorus occidentalis*), double-crested cormorant (*Phalacrocorax auritus*), common loon (*Gavia immer*), and osprey (*Pandion haliaetus*). Bats and some insectivorous bird species can be found foraging over open water.

Wildlife species commonly associated with the nearshore portion of lacustrine habitat include the great blue heron, snowy egret (*Egretta thula*), killdeer, and long-billed curlew. Shallow areas also provide habitat for amphibians and reptiles. Lacustrine habitat also serves as a source of drinking water for wildlife that uses adjacent habitat types.

14.2.1.3 Special-Status Wildlife Species

More than 175 State- or federally-listed threatened or endangered species, candidate species, and State species of special concern may occur within the 39 counties that are included in the Extended Study Area (USFWS, 2009a; USFWS, 2009b; USFWS, 2009c; DFG, 2009a). The counties of the Extended Study Area also include numerous areas of designated critical habitat. However, most of these special-status species would be unlikely to occur in, or depend upon, the urban habitat type.

Although agricultural habitat types tend to be of less value to wildlife than native habitats, some special-status species have adapted to agricultural lands. Species, such as the Swainson's hawk (*Buteo swainsoni*), greater sandhill crane (*Grus canadensis tabida*), and bank swallow (*Riparia riparia*) use agricultural fields as foraging areas. Flooded fields and deciduous orchards have the potential to meet the cover, feeding, and reproduction needs of the giant garter snake and the western yellow-billed cuckoo (*Coccyzus americanus occidentalis*), respectively (DFG, 2008a).

The fresh emergent wetlands of the wildlife refuges and WAs within the Extended Study Area have the potential to meet the cover, feeding, and reproduction needs of special-status species such as the

California tiger salamander (*Ambystoma californiense*), California red-legged frog, greater sandhill crane, and giant garter snake (DFG, 2008a).

The lacustrine habitat of San Luis Reservoir has the potential to support several special-status wildlife species, including the bald eagle and osprey. However, there are no known occurrences of bald eagles or osprey within the four USGS 7.5 minute quadrangles within which San Luis Reservoir is located. The nearest known locations are in eastern Merced County for both species (DFG, 2009a). No bald eagle perch sites have been documented around the reservoir, which is surrounded by annual grassland and blue oak woodland habitats, but occasionally winter use by bald eagles may occur (Reclamation, 2007). The open water habitat of the reservoir has the potential to support special-status species, such as the common loon, redhead (*Aythya americana*), Barrow's goldeneye (*Bucephala islandica*), black tern (*Chlidonias niger*), western snowy plover (*Charadrius alexandrinus nivosus*), and American white pelican (*Pelecanus erythrorhynchos*).

14.2.1.4 Commercially or Recreationally Important Wildlife Species

Many of the harvest species found on agricultural lands are considered to be crop pests, and landowners consequently provide hunting opportunities to control these species. Up to 67 harvest species (39 birds, 27 mammals, and 1 amphibian) may occur within the urban and agricultural habitat types within the Extended Study Area, and up to 38 harvest species (26 birds, 11 mammals, and 1 amphibian) may occur within the fresh emergent wetland habitat on the WAs and refuges within the Extended Study Area (DFG, 2008a). Seasonal waterfowl hunting occurs at San Luis Reservoir. Up to 27 waterfowl harvest species may occur within the lacustrine habitat of this reservoir.

Harvest birds include waterfowl, such as the mallard and greater white-fronted goose, and upland game birds, such as the ring-necked pheasant and wild turkey (*Meleagris gallopavo*). The WAs and refuges within the Extended Study Area have wetlands that are managed for waterfowl and provide waterfowl hunting opportunities to the public in designated areas. Private hunting opportunities exist on the flooded rice fields that are also managed for waterfowl.

Harvest mammals include furbearers, such as the American beaver and American mink; small game, such as the black-tailed jackrabbit and western gray squirrel; and big game, such as the black bear, wild pig, and mule deer.

14.2.2 Secondary Study Area

14.2.2.1 Methodology

Wildlife Habitats and Associated Wildlife

The WHR System (DFG, 2008a) was used to identify the potential number of species that could occur within the 22 counties included in the Secondary Study Area. A WHR species list was generated for the lacustrine, riverine, estuarine, montane riparian, valley foothill riparian, fresh emergent wetland, saline emergent wetland, barren, rice, irrigated grain crops, and irrigated row and field crops habitat types.

Because only 10 counties can be entered into the WHR System at one time, three species lists were generated and then merged for each habitat type.

Special-Status Wildlife Species

A list of special-status wildlife species that may occur within the Secondary Study Area was generated using the Sacramento Fish and Wildlife Office's Endangered Species Program website (USFWS, 2009a).

The list includes federal endangered, threatened, and candidate species that may be affected within the 19 of the 22 counties within the Secondary Study Area that are within their jurisdiction, as well as areas of designated critical habitat. The Arcata Fish and Wildlife Office's Species List Search page was used to generate species lists for Del Norte, Humboldt, and Trinity counties (USFWS, 2009d). The CNDDDB *State and Federally Listed Endangered and Threatened Animals of California* (October 2009) and *Special Animals* (July 2009) lists were also consulted for State-listed species and species of special concern (DFG, 2009a). The generated lists include the entire county, and therefore, may contain species that would be found within the county, but not within the specific habitat types listed above. In addition, CNDDDB's Rarefind 4 was queried for known occurrences within the 22 counties in the specified habitat types.

Commercially or Recreationally Important Wildlife Species

The Secondary Study Area provides seasonal and year-round habitat for a variety of commercially or recreationally important wildlife species. The WHR System (DFG, 2008a) was used to generate a list of all harvest (hunted or trapped) species that could occur within the lacustrine, riverine, estuarine, valley foothill riparian, fresh emergent wetland, saline emergent wetland, and barren habitat types within the 22 counties listed above. Because only ten counties can be entered into the WHR System at one time, three species lists were generated and then merged. A separate list was generated of all harvest species that could exist within the rice, irrigated grain crops, and irrigated row and field crops habitat types within the bypasses of Yolo and Sutter counties.

14.2.2.2 Wildlife Habitats and Associated Wildlife

Lacustrine

Lacustrine habitat is described in the Extended Study Area discussion. Lacustrine habitat within the Secondary Study Area primarily exists at the reservoirs, as well as at the Thermalito Forebay and Afterbay. The Forebay does not experience large water level fluctuations and, is therefore, able to support emergent aquatic vegetation (DWR, 2007a). Portions of the drawdown zone at Shasta Lake are also able to support limited amounts of early successional vegetation, such as willow, cottonwood, and various grasses and forbs (Reclamation, 2004).

Up to 166 species (120 birds, 18 mammals, 9 reptiles, and 19 amphibians) may be found within this habitat type within the Secondary Study Area (DFG, 2008a). Wildlife species commonly associated with lacustrine habitat are listed in the Extended Study Area discussion (Section 14.2.1.2).

Riverine

Riverine habitat includes free-flowing streams and rivers (Mayer and Laudenslayer, 1988a). Riverine habitat within the Secondary Study Area includes the Feather, Sacramento, Trinity, Lower Klamath, and American rivers, as well as Clear and Spring creeks.

Up to 159 species (101 birds, 26 mammals, 8 reptiles, and 24 amphibians) may be found within this habitat type within the Secondary Study Area (DFG, 2008a). Wildlife species commonly associated with the open-water zones of large rivers include the osprey, bald eagle, gulls, terns, and waterfowl. Insectivorous species, such as the Yuma myotis (*Myotis yumanensis*), bank swallow, black swift (*Cypseloides niger*), and black phoebe forage over open water.

Wildlife species commonly associated with the near-shore portions of rivers and streams include the belted kingfisher (*Megaceryle alcyon*), mallard, great egret, killdeer, American dipper (*Cinclus*

mexicanus), foothill yellow-legged frog (*Rana boylei*), western pond turtle, northern river otter, American mink, and common muskrat. Riverine habitat also serves as a source of drinking water for wildlife.

Estuarine

Estuarine habitat occurs on periodically or permanently flooded substrates where tidal seawater mixes with, and is diluted by, flowing fresh water (Mayer and Laudenslayer, 1988a). Estuaries within the Secondary Study Area include the San Francisco, San Pablo, and Suisun bays, the mouth of the Klamath River, and the Sacramento-San Joaquin Delta.

The salinity of estuarine habitats varies seasonally depending on freshwater inflow and tidal action. Estuarine habitat has a low number of species, but a high density of those species that can tolerate the fluctuating salinity levels, such as benthic (bottom dwelling) invertebrates and plankton. Many bird and mammal species use estuarine habitat for feeding, resting, reproduction, and cover. Estuarine sub-tidal habitat supports eel grass (*Zostera* sp.), which the brant (*Branta bernicla*) depends on (Mayer and Laudenslayer, 1988a).

Up to 127 species (120 birds and 7 mammals) may be found within this habitat type within the Secondary Study Area (DFG, 2008a). Wildlife species commonly associated with estuaries include the common loon, western grebe, double-crested cormorant, red-breasted merganser (*Mergus serrator*), lesser scaup (*Aythya affinis*), black-necked stilt (*Himantopus mexicanus*), Caspian tern (*Hydroprogne caspia*), and harbor seal (*Phoca vitulina*).

Montane Riparian

Montane riparian habitat usually occurs as a narrow, often dense, grove of broad-leaved winter deciduous trees, such as maple (*Acer* sp.), cottonwood (*Populus* sp.), and alder (*Alnus* sp.), with a sparse understory. This habitat type is found associated with montane lake, ponds, seeps, bogs, and meadows, as well as rivers, streams and springs, typically below 2,440 meters (m) (8,000 feet) in elevation (Mayer and Laudenslayer, 1988a).

Within the Secondary Study Area, montane riparian habitat that could be affected by Project operation exists along the Trinity and Klamath rivers. In Trinity County, dominant tree species include bigleaf maple (*Acer macrophyllum*), white alder (*Alnus rhombifolia*), Oregon ash (*Fraxinus latifolia*), black cottonwood (*Populus balsamifera*), and black willow (*Salix gooddingii*). Typical understory species include mugwort (*Artemisia douglasiana*), virgin's bower (*Clematis ligusticifolia*), American dogwood (*Cornus sericea*), Oregon golden-aster (*Heterotheca oregona*), straggly gooseberry (*Ribes divaricatum*), Himalayan blackberry (*Rubus discolor*), California blackberry (*Rubus ursinus*), narrow-leaved willow, arroyo willow (*Salix lasiolepis*), and California wild grape (*Vitis californica*) (Reclamation, 2009).

Up to 300 species (159 birds, 91 mammals, 22 reptiles, and 28 amphibians) may be found within this habitat type within the Secondary Study Area (DFG, 2008a). Wildlife species commonly associated with montane riparian habitat include the roughskin newt (*Taricha granulosa*), Pacific chorus frog, Pacific giant salamander (*Dicamptodon tenebrosus*), osprey, peregrine falcon, great horned owl, belted kingfisher, vagrant shrew, long-eared myotis (*Myotis evotis*), western harvest mouse, common muskrat, American mink, California mountain kingsnake (*Lampropeltis zonata*), and western terrestrial garter snake (*Thamnophis elegans*).

Valley Foothill Riparian

Valley foothill riparian habitat occurs in valleys and foothills and is usually associated with low-velocity flows or floodplains. The canopy is dominated by cottonwood, California sycamore (*Platanus racemosa*), and valley oak (*Quercus lobata*). The sub-canopy is dominated by white alder, box elder (*Acer negundo*), and Oregon ash (*Fraxinus latifolia*). The typically impenetrable understory shrub layer includes wild grape, California blackberry, poison oak (*Toxicodendron diversilobum*), and willows. Elderberry shrubs (*Sambucus* sp.) are often associated with this habitat type (Mayer and Laudenslayer, 1988a).

DFG has designated riparian habitat as a sensitive habitat because of its limited abundance and high value to wildlife. Numerous wildlife species use this habitat type for food, water, migration corridors, escape habitat, nesting habitat, and thermal cover. Valley foothill riparian habitat exists within the Secondary Study Area along the rivers and creeks, as well as within the Yolo and Sutter bypasses. Most remaining stretches of riparian habitat are narrow and fragmented. However, the Oroville WA contains over 3,000 acres of valley foothill riparian habitat, representing the largest remaining block of riparian habitat along the Feather River (DWR, 2007b).

Up to 312 species (188 birds, 73 mammals, 27 reptiles, and 24 amphibians) may be found within this habitat type within the Secondary Study Area (DFG, 2008a). Wildlife species commonly associated with valley foothill riparian habitat include the California slender salamander (*Batrachoseps attenuatus*), foothill yellow-legged frog, green heron (*Butorides virescens*), osprey, California quail, great horned owl (*Bubo virginianus*), belted kingfisher, downy woodpecker (*Picoides pubescens*), black phoebe, bank swallow, canyon wren (*Catherpes mexicanus*), vagrant shrew (*Sorex vagrans*), several bat species, western gray squirrel, ringtail (*Bassariscus astutus*), American mink, western pond turtle, western skink (*Eumeces skiltonianus*), common kingsnake (*Lampropeltis getula*), and western aquatic garter snake (*Thamnophis couchii*). The WHR System does not include invertebrates, but the valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is also associated with this habitat type when elderberry shrubs are present.

Fresh Emergent Wetland

Fresh emergent wetland is described in the Extended Study Area discussion (Section 14.2.1.2). Fresh emergent wetland occurs throughout the secondary study area at the confluence of streams and reservoirs, in landscape depressions along the creeks and rivers, in backwater areas of the rivers, in dredger ponds, around Thermalito Forebay and Afterbay, and in the Yolo and Sutter bypasses. Wetlands also occur in seeps and springs above the high water lines of the reservoirs, but typically are absent within the drawdown zone of the reservoirs. More than 850 acres of wetlands are present within the Thermalito Complex (DWR, 2007b; Reclamation, 2009).

Up to 189 species (121 birds, 36 mammals, 12 reptiles, and 20 amphibians) may be found within this habitat type within the Secondary Study Area (DFG, 2008a). Wildlife species commonly associated with fresh emergent wetland are listed in the Extended Study Area discussion (Section 14.2.1.2).

Saline Emergent Wetland

Saline emergent wetland consists of salt or brackish marshes and contains vegetation, such as cordgrass (*Spartina* sp.), pickleweed (*Salicornia* sp), saltgrass (*Distichlis spicata*), and glasswort (*Salicornia* sp.). These wetlands occur above intertidal sand and mud flats and below upland communities not subject to tidal action, mainly along the margins of bays, lagoons, and estuaries. Within the Secondary Study Area, saline emergent wetland habitat occurs around San Pablo Bay, Suisun Bay, and portions of the Delta, with

the largest stands of saline emergent wetland occurring in San Francisco Bay (Mayer and Laudenslayer, 1988a).

Up to 119 species (112 birds and 17 mammals) may be found within this habitat type within the Secondary Study Area (DFG, 2008a). Wildlife species commonly associated with saline emergent wetland include the eared grebe, black-crowned night heron, peregrine falcon (*Falco peregrinus*), California black rail (*Laterallus jamaicensis coturniculus*), California clapper rail (*Rallus longirostris obsoletus*), short-eared owl, red-winged blackbird, salt marsh harvest mouse (*Reithrodontomys raviventris*), and American mink.

Barren

Barren habitat is defined by the absence of vegetation, although opportunistic grasses and forbs or weedy species may occur. Barren habitat exists in many forms throughout the Secondary Study Area. The mudflats surrounding estuarine, fresh emergent wetland, and saline emergent wetland habitats are considered to be barren habitat. Along rivers, barren habitat includes vertical river banks and canyon walls, sealed rip-rap features, dredger tailings, rock outcrops, and gravel bars adjacent to the rivers. Barren habitat also includes the drawdown zone of reservoirs (Mayer and Laudenslayer, 1988a; Reclamation, 2004; Reclamation, 2009).

Up to 124 species (86 birds, 35 mammals, 2 reptiles, and 1 amphibian) may be found within this habitat type within the Secondary Study Area (DFG, 2008a). Wildlife species commonly associated with barren habitat include the killdeer, bank swallow, belted kingfisher, black swift and American avocet (*Recurvirostra americana*).

Rice

Rice habitat is described in the Extended Study Area discussion (Section 14.2.1.2). Rice is the predominant crop type within the Yolo and Sutter bypasses. Up to 194 species (136 birds, 33 mammals, 19 reptiles, and 6 amphibians) may be found within this habitat type within the Secondary Study Area (DFG, 2008a). Wildlife species commonly associated with rice are listed in the Extended Study Area discussion (Section 14.2.1.2).

Irrigated Grain Crops

Irrigated grain crops are described in the Extended Study Area discussion (Section 14.2.1.2). Crops, such as corn and safflower, are grown in the Secondary Study Area within the Yolo and Sutter bypasses. Up to 157 species (98 birds, 50 mammals, 5 reptiles, and 4 amphibians) may be found within this habitat type within the Secondary Study Area (DFG, 2008a). Wildlife species commonly associated with irrigated grain crops are listed in the Extended Study Area discussion (Section 14.2.1.2).

Irrigated Row and Field Crops

Irrigated row and field crops are described in the Extended Study Area discussion (Section 14.2.1.2). Crops, such as tomatoes and melons, are grown in the Secondary Study Area within the Yolo and Sutter bypasses. Up to 107 species (43 birds, 50 mammals, 9 reptiles, and 5 amphibians) may be found within this habitat type within the Secondary Study Area (DFG, 2008a). Wildlife species commonly associated with irrigated row and field crops are listed in the Extended Study Area discussion (Section 14.2.1.2).

14.2.2.3 Special-Status Wildlife Species

More than 60 State- and federally-listed species, candidate species, and species of special concern may occur within the counties of the Secondary Study Area (USFWS, 2009a; USFWS, 2009d; DFG, 2009a). These counties also include numerous areas of designated critical habitat. Many of these special-status species would not be affected by changes in stream flow patterns or fluctuating reservoir levels. Thirteen of these special-status species could be affected by changes to existing facility operations in the Secondary Study Area as a result of the Project. The 13 listed species that could be affected by these operational changes are discussed below.

Reptiles and Amphibians

California Red-Legged Frog

The California red-legged frog inhabits humid forests, woodlands, grasslands, and stream sides where dense shrubby or riparian vegetation provides good cover. This species can be found in streams, lakes, reservoirs, ponds, or other permanent sources of water, but is generally absent from water sources that are inhabited by the bullfrog (Stebbins, 1985, Stebbins and Cohen, 1995).

The California red-legged frog is known to occur in streams in 13 of the 22 counties within the Secondary Study Area. The locations of those occurrences include tributary creeks, coastal streams, and small ponds and lakes (DFG, 2010b). In 2002 the USFWS prepared the *Recovery Plan for the California Red-Legged Frog*. The objective of the plan is to reduce threats and improve the population status of the California red-legged frog sufficiently to warrant delisting. The plan contains maps of recovery units. Within the recovery units, there are several areas that have been identified as core areas where recovery actions will be focused. Two of those core areas are located within the Secondary Study Area. The Cottonwood Creek Core Area includes Lower Cottonwood Creek and its confluence with the Sacramento River in Shasta and Tehama counties. The South San Francisco Bay Core Area includes the edge of San Francisco Bay within Marin County (USFWS, 2002).

Foothill Yellow-Legged Frog

The foothill yellow-legged frog ranges from the Oregon border to Los Angeles County along the Coast Ranges, in northern California west of the Cascade Crest, and along the Sierras to Kern County at elevations ranging from near sea level to 1942 m (6,370 ft). This frog is found in a variety of habitats in or near rocky streams, including valley foothill riparian, mixed chaparral, mixed conifer, and wet meadow.

This species uses submerged rock or sediment as cover when disturbed, and seeks cover under rocks instream or near water during periods of inactivity. The foothill yellow-legged frog is rarely found away from a permanent water source, and tadpoles require a permanent water source for up to four months during development. Breeding and egg-laying occur from mid-March to May following spring flooding (Mayer and Laudenslayer, 1988b).

The foothill yellow-legged frog is known to occur in 20 of the 22 counties within the secondary study area, but is not found in the valley portions of many of those counties. Foothill yellow-legged frogs have been observed in the canyon reach of lower Clear Creek downstream of Whiskeytown Dam, and are known to occur in the Trinity River from Lewiston Dam to the North Fork Trinity River (Reclamation, 2009; BLM, 2008).

Giant Garter Snake

The giant garter snake inhabits agricultural wetlands and other waterways, such as irrigation and drainage canals, sloughs, ponds, small lakes, low gradient streams, and adjacent uplands in the Central Valley. Because of the direct loss of natural habitat from agricultural and urban development, the giant garter snake relies heavily on rice fields and their associated drains and canals in the Sacramento Valley. Giant garter snakes are typically absent from larger rivers because of lack of suitable habitat and emergent vegetative cover, and from wetlands with sand, gravel, or rock substrates. Riparian woodlands typically do not provide suitable habitat because of excessive shade, lack of basking (sunning) sites, and absence of prey populations (USFWS, 2009e).

Within the Secondary Study Area, the giant garter snake is presumed to occur in Butte, Colusa, Glenn, Sacramento, Solano, Sutter and Yolo counties. Suitable giant garter snake habitat exists within portions of the Thermalito Forebay and Afterbay, the Oroville WA, lands subject to rice agriculture adjacent to Thermalito Afterbay, and in isolated patches of backwater habitats along the Feather River (DWR, 2007a). This species is known to occur along the western border of the Yolo Bypass, and was documented in the western Delta in 1998 in the vicinity of Sherman Island. Although giant garter snakes have not been documented within the Sutter Bypass, they are known to occur on the lands immediately adjacent to the bypass and therefore may occur within suitable habitat in the bypass.

The USFWS has proposed recovery units where recovery actions are needed to benefit the giant garter snake. The Sacramento Valley and Mid Valley recovery units, which are located within the Secondary Study Area, include stretches of the Sacramento, Feather, and American rivers, the Yolo and Sutter bypasses, and portions of the Sacramento-San Joaquin Delta (USFWS, 1999a). Although the rivers are not expected to provide suitable habitat for the giant garter snake, some of the oxbows and backwater sloughs, as well as the lands immediately adjacent to the rivers, may provide suitable habitat.

San Francisco Garter Snake

The San Francisco garter snake's (*Thamnophis sirtalis tetrataenia*) preferred habitat is densely vegetated ponds that are located near open hillsides or levees. Hillsides and levees are also used by the snake for basking, feeding, and cover (e.g., rodent burrows) (USFWS, 2002).

Currently, this species is found in only a few localities in San Francisco and San Mateo counties. Within the Secondary Study Area, occurrences of the San Francisco garter snake are known in the vicinity of South San Francisco Bay.

Western Pond Turtle

The western pond turtle ranges throughout California west of the Sierra-Cascade crest, with the exception of the desert regions, at elevations ranging from near sea level to 1430 m (4,690 ft). This turtle is associated with water that is permanent or nearly permanent in a variety of habitats. The western pond turtle uses rocks, floating vegetation, or other partially submerged substrates as basking sites, and seeks cover underwater when disturbed. Females travel on land to seek out suitable nest sites in spring or early summer, laying eggs from March to August (Mayer and Laudenslayer, 1988b).

Western pond turtles can be found throughout the Secondary Study Area in lacustrine, riverine, fresh emergent wetland, montane riparian, and valley foothill riparian habitats.

Birds

Bald Eagle

Wintering bald eagles use a wide variety of habitats including lacustrine, riverine, riparian, emergent wetland, and agricultural croplands. Nesting bald eagles are restricted to habitats associated with large fish-bearing lakes, reservoirs, and rivers with suitable nest trees (Lehman, 1979; Mayer and Laudenslayer, 1988c). The breeding season ranges from February through July.

Bald eagles winter throughout most of the Secondary Study Area in suitable habitat, with extensive winter use occurring at Lake Oroville and Lake Shasta, and regular use occurring along the Feather and Sacramento rivers. A substantial number of bald eagle nests have been documented at Lake Shasta. Nesting bald eagles have also been documented on Lake Oroville and at the Diversion Pool; on the Feather, Klamath, Sacramento, and Trinity rivers; and at Folsom, Lewiston, Trinity, and Whiskeytown lakes (DFG, 2007b; BLM, 2008; DWR, 2007a; Reclamation, 2008; DFG, 2010a).

Bank Swallow

Bank swallows are migratory birds that live in colonies and nest in cavities. Bank swallows use a variety of habitats in and around the Sacramento Valley. Nesting is restricted to riparian, lacustrine, or riverine habitats with vertical cliffs or banks composed of sandy or loamy soils near water (Garrison et al., 1987, Mayer and Laudenslayer, 1988c). Nesting does not normally occur on ephemeral streams or on compacted clay or gravelly substrates. The breeding season ranges from mid-March through July. Foraging activities occur primarily over riparian habitat where insects are taken while flying.

Within the Secondary Study Area, bank swallows are known to occur in many areas, including along the Sacramento River in Shasta, Tehama, Butte, Glenn, Colusa, Sutter and Yolo counties, along the Feather River, in coastal areas of San Francisco County, along the American River in the San Juan Rapids area, and along Seven-Mile slough near Three-Mile Slough in the Sacramento-San Joaquin Delta. Nesting bank swallows have also been observed on lower Clear Creek.

Annual protocol-level bank swallow surveys are conducted on the Sacramento and Feather rivers by DFG, USFWS, and DWR. Surveys on the Sacramento River in 2008 and 2009 documented 65 and 64 active bank swallow colonies, respectively. The 2008 surveys were conducted from the Red Bluff Diversion Dam to Verona, and the 2009 surveys were conducted from Keswick Dam to Verona. Surveys on the Feather River in 2008 and 2009 documented 18 and 20 active bank swallow colonies, respectively, located from downstream of the Thermalito Afterbay outlet to the confluence with the Sacramento River (DFG, 2008b; DFG, 2009e).

California Black Rail

The California black rail is found in the high wetland zones of saline or brackish emergent wetlands associated with heavy growth of pickleweed or with bulrush in association with pickleweed. In freshwater emergent wetlands, it prefers bulrushes, cattails, and saltgrass. This species typically does not occur in low wetland areas with considerable fluctuations in water levels. This species is mostly resident, but may winter in areas where it does not breed (Mayer and Laudenslayer, 1988c).

Within the Secondary Study Area, California black rails occur in San Francisco, San Pablo, and Suisun bays, as well as in portions of the Delta. The majority of breeders occur at San Pablo Bay.

California Clapper Rail

The California clapper rail is a resident in saline, fresh, or brackish emergent wetlands in the vicinity of San Francisco Bay. This species is restricted to emergent wetlands and tidal sloughs with heavy growth of pickleweed and cordgrass, and in brackish wetlands with pickleweed, cordgrass, and bulrush. California clapper rails require shallow water and mudflats for foraging, as well as adjacent higher vegetation for cover during high water (Mayer and Laudenslayer, 1988c).

Within the Secondary Study Area, the California clapper rail is known to occur along San Francisco Bay, San Pablo Bay, and Suisun Bay and Marsh.

Greater Sandhill Crane

Greater sandhill cranes currently breed in Great Basin habitats in northern California where they select open, shallow lacustrine, irrigated pasture, or wetland habitats for nesting. Saline waters are avoided. Winter habitat consists of annual and perennial grasslands, moist croplands (corn, sorghum, barley, and rice), or emergent wetlands (Mayer and Laudenslayer, 1988c).

Within the Secondary Study Area, many greater and lesser sandhill cranes winter in the interior of the Sacramento Valley. The emergent wetlands of the Delta also provide suitable foraging habitat for these species.

Willow Flycatcher

The willow flycatcher prefers montane riparian areas and large wet meadows with abundant willows. They are most numerous where there are extensive thickets of low dense willows on the edge of wet meadows, ponds, or backwaters (Mayer and Laudenslayer, 1988c).

Within the Secondary Study Area, willow flycatchers have been regularly observed foraging along lower Clear Creek during spring and fall migration, but no nesting has been observed in the lower Clear Creek watershed (BLM, 2008). This species has also been observed along the Trinity River corridor (Reclamation, 2009), and may use riparian woodlands during migration along the Upper Sacramento River from the Red Bluff Diversion Dam to Shasta Dam (Reclamation, 2008).

Western Yellow-Billed Cuckoo

The western yellow-billed cuckoo is a migratory species that does not winter in California. Suitable nesting habitat, typically in dense mixed riparian forest habitat, consists of extensive (25 acres or larger) riparian forest with dense understory (willow) near slow moving waters (Mayer and Laudenslayer, 1988c). Walnut orchards adjacent to riparian areas have also been used successfully as nesting habitat (Laymon, 1980).

Within the Secondary Study Area, several small isolated breeding populations occur in suitable habitat along the upper Sacramento River, as well as along the lower Feather River. One individual western yellow-billed cuckoo was observed in lower Clear Creek in 2004, but this species is not believed to nest in that area (DFG, 2008a; Reclamation, 2008; DWR, 2007a; BLM, 2008).

Mammals

Salt-Marsh Harvest Mouse

The salt-marsh harvest mouse (*Reithrodontomys raviventris*) is found only in saline emergent wetland habitat, with a preference for areas of dense pickleweed. This species also requires nearby non-submerged, salt-tolerant vegetation for escape during highest tides (Mayer and Laudenslayer, 1988d).

The salt-marsh harvest mouse is found within the Secondary Study Area in the saline emergent wetlands around San Francisco, San Pablo, and Suisun bays, as well as portions of the Delta (DFG, 2008a; Reclamation, 2006).

14.2.2.4 Commercially or Recreationally Important Wildlife Species

Up to 67 harvest species (43 birds, 23 mammals, and 1 amphibian) may occur in the Secondary Study Area within the 7 natural habitat types, and up to 52 harvest species (31 birds, 20 mammals, and 1 amphibian) may occur in the Sutter and Yolo county portion of the Secondary Study Area within the 3 agricultural habitat types (DFG, 2008a). Examples of harvest bird and mammal species are listed in the Extended Study Area discussion (Section 14.2.1.4).

The Secondary Study Area includes portions of 11 of the State's deer hunting zones (DFG, 2009b). The Oroville WA, as well as the managed wetlands and flooded rice fields of private duck clubs within the Sutter and Yolo bypasses, provide waterfowl hunting opportunities (DWR, 2007a).

14.2.3 Primary Study Area

14.2.3.1 Methodology

Wildlife Habitats and Associated Wildlife

The vegetation types within the proposed Sites Reservoir footprint were delineated by hand on aerial photo overlays, field-verified, and digitized. Vegetation types in other Project facility locations were delineated using ArcView GIS software, aerial photo interpretation, and field verification. A detailed description of survey methods used to map vegetation is provided in Chapter 13 Botanical Resources. Mapped vegetation types were reclassified into WHR habitat types. The WHR System (DFG, 2008a) was then used to identify the potential number of wildlife species that could occur within the habitat types in the Primary Study Area.

A variety of research and field survey methods were used to sample wildlife. Preliminary research included general literature searches, consultation with agency and species experts, aerial photo habitat interpretations, and landowner interviews. In addition, reviews of the CNDDDB, WHR System, and the Federal Register of Threatened, Endangered, and Special-Status Species were conducted.

Initial field surveys were conducted within the Primary Study Area from 1998 to 2004 at all Project facility locations, then again in 2010 to 2011 at newly proposed Project facility locations. Amphibian and reptile surveys included night driving, dip-netting, seining, ground searches, and habitat assessment. Avian surveys included line transects and bank swallow, cuckoo, and owl surveys. Mammal surveys included small mammal trapping, mist netting, acoustical surveys, roost searches, track plates, camera stations, spotlighting, general habitat measurements and assessment, and incidental observation. Detailed descriptions of these survey methods are listed in their associated survey progress reports (DFG, 2003a; DFG, 2003b; DWR, 2003).

Special-Status Wildlife Species

A current list of special-status wildlife was generated using the Sacramento USFWS Office's Endangered Species Program website (USFWS, 2009a). The list covered the following U.S. Geological Survey 7.5-minute quadrangle maps (map numbers are provided in parentheses): Leesville (547B), Manor Slough (547A), Lodoga (563C), Sites (563D), Maxwell (562C), Moulton Weir (562D), Rail Canyon (563B), and Logan Ridge (563A). The list includes federal endangered, threatened, and candidate species that may be affected within the Primary Study Area, as well as areas of designated critical habitat. The list was

generated prior to initiation of field surveys (September 1997 and October 1998), updated during the development of the progress report (July 2002), and updated again during the preparation of this environmental document (October 2009).

The CNDDDB *State and Federally Listed Endangered and Threatened Animals of California* (October 2009) and *Special Animals* (July 2009) lists were also consulted for State-listed wildlife species and species of special concern. Wildlife species listed as federal species of concern, State species of special concern, or State fully protected species were included. Species which were listed at the start of field surveys, but have since been delisted, were not included. Species designated as only BLM or USFS Sensitive Species were not included because the Project features are not proposed to be constructed on USFS or BLM land. In addition, bat species designated as High Priority by the Western Bat Working Group, but not with a State or federal status, were not included.

The CNDDDB's Rarefind 3 and Rarefind 4 software were used to document the nearest known locations to the Primary Study Area of threatened or endangered species that were not observed during field surveys. Lack of documentation in the Rarefind database within a county does not imply absence of the species in that county.

During field surveys, the valley elderberry longhorn beetle (VELB) was surveyed according to procedures outlined in the USFWS 1996 report on mitigation guidelines. Subsequent surveys followed the 1999 guidelines. Vernal pool crustaceans were sampled in accordance with the USFWS protocols contained in "Interim Survey Guidelines to Permittees for Recovery Permits pursuant to Section 10(a)(1)(A) of the Endangered Species Act for the Listed Vernal Pool Branchiopods" (April 19, 1996).

Amphibian and reptile surveys included night driving, dip-netting, seining, ground searches, habitat assessment, consultation with USFWS, and the use of USFWS and DFG's protocol guidelines for red-legged frog and California tiger salamander. Avian surveys included line transects and bank swallow, owl, and yellow-billed cuckoo surveys. Mammal surveys included small mammal trapping, mist netting, acoustical surveys, roost searches, track plates, camera stations, spotlighting, general habitat measurements and assessment, and incidental observation. Detailed descriptions of these survey methods, as well as more detailed species life history accounts, are included in their associated survey progress reports (DFG, 2003a; DFG, 2003b; DWR, 2003).

Commercially or Recreationally Important Wildlife Species

The Primary Study Area provides seasonal and year-round habitat for a variety of commercially or recreationally important wildlife species. The WHR System (DFG, 2008a) was used to generate a list of all harvest (hunted or trapped) species that could occur in Colusa and Glenn counties within the habitat types present in the Primary Study Area.

14.2.3.2 Wildlife Habitats and Associated Wildlife

Eighteen wildlife habitat types were identified within the Primary Study Area. Of those 18 wildlife habitat types, the principal types, based on total acreage within the Primary Study Area, include annual grassland, blue oak woodland, rice, dryland grain and seed crops, irrigated row and field crops, pasture, lacustrine, urban/disturbed, and valley foothill riparian. The total acreage of each habitat type within the Primary Study Area, as well as the percent that each habitat type represents of the total Project acreage, is

presented in Table 14-1. Acreage totals reflect baseline conditions² and represent the Project alternative that has the largest construction-related on-the-ground disturbance (Alternative C). Acreage totals include the footprint of each Project facility and the defined construction disturbance area for the Delevan Pipeline. The principal habitat types are described below.

**Table 14-1
Wildlife Habitat Types within the Primary Study Area**

Habitat Type	Acreage	
	Primary Study Area ^a	Percent of Primary Study Area Total
Annual grassland	14,765.5	75.4
Barren ^b	21.6	0.1
Blue oak woodland	1,531.9	7.8
Canal	22.4	0.1
Chamise-redshank chaparral	2.5	0 ^e
Deciduous orchard	188.6	1.0
Dryland grain and seed crops	535.9	2.7
Eucalyptus	46.2	0.2
Fresh emergent wetland ^c	18.5	0.1
Irrigated row and field crops	366.1	1.9
Lacustrine ^d	28.8	0.2
Mixed chaparral	2.6	0 ^e
Pasture	312.7	1.6
Rice	1,493.7	7.6
Riverine	1.6	0 ^e
Urban/disturbed	136.8	0.7
Valley foothill riparian	113.6	0.6
Valley oak woodland	3.5	0 ^e
TOTAL	19,592.0	100

^aThe Primary Study Area includes the proposed Alternative C facility footprints, and the construction disturbance area for the Road Relocations, Delevan Transmission Line, Delevan and TRR pipelines, TRR to Funks Creek Pipeline, Holthouse to T-C Canal Pipeline, and GCID Canal Facilities Modifications. This total does not include acreage occupied by existing facilities, namely Funks Reservoir and the GCID Canal.

^bBarren habitat includes fallowed agricultural fields.

^cFresh Emergent Wetland includes alkaline wetlands.

^dLacustrine habitat includes ponds.

^eRepresents less than 0.1 percent of total.

Annual Grassland

Annual grassland habitat occurs mostly on flat plains to rolling foothills and is composed primarily of introduced annual plant species. Perennial species can occur in moist areas, and vernal pools can occur within annual grassland habitat where depressions are underlain by impervious clay or hardpan soils. Grassland composition and structure depends on precipitation and grazing practices (Mayer and Laudenslayer, 1988a).

² Agricultural habitat types change from year to year and vary between actively managed and fallowed fields. Additional acreage of natural habitat types have been converted to agricultural habitat types since the time of baseline.

Approximately 75 percent of the Primary Study Area is annual grassland habitat (representing less than one percent of the total acreage of this habitat type found throughout California). Extensive annual grassland habitat occurs at all Project facility locations, except for the Delevan Pipeline Intake/Discharge facilities. Within the grassland areas are livestock ponds, small rock outcrops, and vernal pools and swales. Yellow star thistle infestations are common.

Up to 196 species (116 birds, 51 mammals, 18 reptiles, and 11 amphibians) may be found within this habitat type within the Primary Study Area (DFG, 2008a). Wildlife species frequently observed during field surveys in annual grassland habitat included the Pacific chorus frog, western fence lizard, western rattlesnake (*Crotalus viridis*), western meadowlark (*Sturnella neglecta*), horned lark (*Eremophila alpestris*), American kestrel, turkey vulture (*Cathartes aura*), deer mouse (*Peromyscus maniculatus*), San Joaquin pocket mouse, California ground squirrel, black-tailed jackrabbit, American badger (*Taxidea taxus*), mule deer, and coyote (*Canis latrans*).

Blue Oak Woodland

Blue oak woodland habitat generally has an overstory of scattered trees, with varying densities of blue oaks (*Quercus douglasii*) comprising 85 to 100 percent of the trees present. This habitat includes the interior live oak (*Q. wislizenii*) and the valley oak. Shrubs, such as chamise (*Adenostoma fasciculatum*), buckbrush (*Ceanothus cuneatus*), and whiteleaf manzanita (*Arctostaphylos viscida*), are often present, and the typical understory is composed of an extension of annual grassland vegetation. Blue oaks grow slowly and regeneration is rarely successful on grazed lands (Mayer and Laudenslayer, 1988a).

More than seven percent of the Primary Study Area is blue oak woodland habitat (representing less than one percent of the total acreage of this habitat type found throughout California). Blue oak woodland habitat occurs in varying forms within the Primary Study Area in smaller valleys, on slopes, on ridge tops, and in moderately rocky to well-drained areas. Project facility locations vary widely in the representation of blue oak-dominated woodlands. Woodlands range from sparse stands of large-diameter trees to dense stands of small-diameter trees. Stands include a few snags and logs, as well as brush piles and stumps that are the result of fuel wood harvest activities. Blue oak woodland exists within the proposed Sites Reservoir footprint, along portions of most of the road relocations (excluding the North Road and Eastside Road), and at all of the Recreation Areas, with the exception of Saddle Dam.

Up to 227 species (141 birds, 54 mammals, 19 reptiles, and 13 amphibians) may be found within this habitat type within the Primary Study Area (DFG, 2008a). Wildlife species frequently observed during field surveys in blue oak woodland habitat included the California slender salamander, western fence lizard, southern alligator lizard (*Elgaria multicarinata*), acorn woodpecker (*Melanerpes formicivorus*), northern flicker (*Colaptes auratus*), brush mouse, California ground squirrel, black-tailed jackrabbit, raccoon, and wild pig.

Dryland Grain and Seed Crops

Dryland grain and seed crops habitat includes non-irrigated barley, oats, and wheat. These grain and seed crops are typically planted in the fall and harvested in the spring, often in rotation with irrigated crops or fallowed for a few seasons. Dryland grain and seed crops are usually planted on fertile soils that once supported diverse native habitats, although barley can be grown on poor quality saline or alkaline soils. These monoculture, harvested, and chemically-controlled crops have limited value to most wildlife, but species, such as deer, elk, and pigs, have adapted and can be crop pests (Mayer and Laudenslayer, 1988a).

More than two percent of the Primary Study Area is dryland grain and seed crops (representing less than one percent of the total acreage of this habitat type found throughout California). Dryland grain and seed crops exist within the Primary Study Area mainly within the proposed Sites Reservoir footprint, and in smaller amounts along the Delevan Pipeline, within the footprints of the Terminal Regulating Reservoir (TRR) and Holthouse Reservoir, and along Sulphur Gap Road.

Up to 106 species (54 birds, 42 mammals, 6 reptiles, and 4 amphibians) may be found within this habitat type within the Primary Study Area (DFG, 2008a). Wildlife species commonly associated with dryland grain and seed crops include the northern harrier, ring-necked pheasant, red-winged blackbird, and Botta's pocket gopher.

Irrigated Row and Field Crops

Irrigated row and field crops are described in the Extended Study Area discussion (Section 14.2.1.2). Nearly two percent of the Primary Study Area is irrigated row and field crops (representing less than one percent of the total acreage of this habitat type found throughout California). This crop type is found within the footprint of Holthouse Reservoir, and within the construction disturbance areas of the Delevan Pipeline and Delevan Transmission Line.

Up to 94 species (41 birds, 43 mammals, 6 reptiles, and 4 amphibians) may be found within this habitat type within the Primary Study Area (DFG, 2008a). Wildlife species commonly associated with irrigated row and field crops habitat are described in the Extended Study Area discussion (Section 14.2.1.2).

Lacustrine

Lacustrine habitat is described in the Secondary Study Area discussion (Section 14.2.2.2). Approximately one percent of the Primary Study Area is lacustrine habitat³. Lacustrine habitat, in the form of human-made ponds, is found in small amounts within the proposed Sites Reservoir footprint and Saddle Dam and Lurline Headwaters recreation areas, as well as along the portions of all road segments and the Delevan Pipeline. The majority of the acreage of lacustrine habitat occurs at the existing Funks Reservoir.

Up to 135 species (103 birds, 17 mammals, 5 reptiles, and 10 amphibians) may be found within this habitat type within the Primary Study Area (DFG, 2008a). Wildlife species frequently observed during field surveys in lacustrine habitat included the mallard, western grebe, great blue heron, and American coot.

Pasture

Pasture habitat is described in the Extended Study Area discussion (Section 14.2.1.2). More than one percent of the Primary Study area is pasture habitat (representing less than one percent of the total acreage of this habitat type found throughout California). Within the Primary Study Area, pasture is found mainly within the proposed Sites Reservoir footprint. Pasture is also found to a lesser extent along the Delevan Pipeline and within the footprint of the TRR.

Up to 72 species (9 birds, 49 mammals, 10 reptiles, and 4 amphibians) may be found within this habitat type within the Primary Study Area (DFG, 2008a). Wildlife species commonly associated with pasture habitat are described in the Extended Study Area discussion (Section 14.2.1.2).

³ The total acreage of lacustrine habitat throughout California is not available. Therefore, the percentage of total lacustrine habitat that the lacustrine habitat in the Primary Study Area would encompass cannot be determined.

Rice

Rice habitat is described in the Extended Study Area discussion (Section 14.2.1.2). More than seven percent of the Primary Study Area is rice habitat (representing less than one percent of the total acreage of this habitat type found throughout California). Within the Primary Study Area, the Delevan Pipeline route and TRR have substantial rice coverage.

Up to 186 species (133 birds, 33 mammals, 15 reptiles, and 5 amphibians) may be found within this habitat type within the Primary Study Area (DFG, 2008a). Wildlife species frequently observed during field surveys in rice habitat included the great blue heron, great egret, and raccoon.

Urban/Disturbed

Urban/disturbed habitat is described in the Extended Study Area discussion (Section 14.2.1.2). Less than one percent of the Primary Study Area is urban/disturbed habitat (representing less than one percent of the total acreage of this habitat type found throughout California). Urban/disturbed habitat exists within the Primary Study Area in the form of residences, outbuildings, and stockyards. These sites may include non-native ornamental varieties of plants, or may support very little or no vegetation. Urban areas are located within most of the proposed Project facility locations, with the exception of the Delevan Pipeline Intake/Discharge facilities, Holthouse Reservoir, Funks Reservoir, and the Recreation Areas. Up to 192 species (147 birds, 34 mammals, 7 reptiles, and 4 amphibians) may be found within this habitat type within the Primary Study Area (DFG, 2008a). Wildlife species frequently observed during field surveys in this habitat type and associated with structures included the house sparrow, yellow-billed magpie, and pallid bat (*Antrozous pallidus*).

Valley Foothill Riparian

Valley foothill riparian habitat is described in the Secondary Study Area discussion (Section 14.2.2.2). Less than one percent of the Primary Study Area is valley foothill riparian habitat (representing less than one percent of the total acreage of this habitat type found throughout California). Valley foothill riparian habitat was mapped in areas where no single woody species dominated the riparian canopy, and where streamside vegetation was dominated by the valley oak. Mexican elderberry (*Sambucus mexicana*) occurs within or adjacent to riparian areas, as individuals or in small stands. Streams within this habitat type are intermittent, and streambeds are typically dry or contain only isolated pools of water during summer.

Disturbed valley foothill riparian is scattered in small patches throughout the proposed Sites Reservoir footprint, at Funks and Holthouse reservoirs, at the Delevan Pipeline Intake/Discharge facilities, and is found in very small amounts along portions of most roads (excluding the saddle dam and recreation area access roads) and the Delevan Pipeline route. Up to 267 species (176 birds, 58 mammals, 19 reptiles, and 14 amphibians) may be found within this habitat type within the Primary Study Area (DFG, 2008a). Wildlife species frequently observed during field surveys in this habitat type included the bullfrog, western toad, western fence lizard, common garter snake, killdeer, raccoon, gray fox (*Urocyon cinereoargenteus*), coyote, and mule deer.

14.2.3.3 Wildlife Habitats at the Proposed Project/Proposed Action Facility Locations

The wildlife habitat types at each Project facility location are presented in Table 14-2.

Table 14-2
Wildlife Habitat Types at each Project Facility Location

Project facility	Annual Grassland	Barren	Blue oak Woodland	Canal	Chamise-redshank Chaparral	Deciduous Orchard	Dryland grain and Seed Crops	Eucalyptus	Fresh Emergent Wetland	Irrigated row and Field Crops	Lacustrine	Mixed Chaparral	Pasture	Rice	Riverine	Urban/Disturbed	Valley Foothill Riparian	Valley Oak Woodland
Sites Reservoir and Dams	x		x				x				x		x			x	X	x
Recreation Areas	x		x		x						x							
Road Relocations and South Bridge	x		x	x	x		x				x	x				x	X	
Sites Reservoir Inlet / Outlet Structure and Sites Pumping / Generating Plant	x										x					x	X	
Tunnel from Sites Pumping / Generating Plant to Sites Inlet / Outlet Structure	x																	
Sites Electrical Switchyard	x																	
Field Office Maintenance Yard	x																	
Holthouse Reservoir Complex and Holthouse Reservoir Electrical Switchyard	x			x			x			x	x					x	X	
GCID Canal Facilities Modifications				x												x		
GCID Canal Connection to the TRR				x			x											
Terminal Regulating Reservoir							x						x	x		x		
TRR Pumping / Generating Plant and TRR Electrical Switchyard														x				
TRR Pipeline and TRR Pipeline Road				x			x						x	x				
Delevan Pipeline and Delevan Pipeline Electrical Switchyard		x		x		x	x	x	x	x	x		x	x		x		
Delevan Transmission Line	x	x		x		x	x	x	x	x	x		x	x		x	X	
Delevan Pipeline Intake / Discharge Facilities				x		x									x	x	X	
Project Buffer	x	x	x	x	x	x	x			x	x		x	x		x	X	x

14.2.3.4 Special-Status Wildlife Species – Threatened, Endangered, or Candidate Species

Fifteen threatened, endangered, or candidate wildlife species may occur within the Primary Study Area (Table 14-3) (USFWS, 2009a; DFG, 2009a). Of those 15 species, field surveys, consultations, and post-survey observations resulted in the documentation of five species. Species accounts for the

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15 species are provided below. No critical habitat for any species has been designated within the Primary Study Area.

Table 14-3
State-and Federally-Listed Terrestrial Wildlife Species that may Occur in the Primary Study Area

Species	Scientific Name	Status ^a	Habitat Association ^b
Invertebrates			
Conservancy fairy shrimp	<i>Branchinecta conservatio</i>	FE	AGS
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT	AGS
Vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	FE	AGS
Valley elderberry longhorn beetle ^c	<i>Desmocerus californicus dimorphus</i>	FT	VRI
Reptiles and Amphibians			
California red-legged frog	<i>Rana aurora draytonii</i>	FT	FEW, AGS, BOW, BOP
California tiger salamander	<i>Ambystoma californiense</i>	FT, ST ^e	AGS, VOW
Giant garter snake ^d	<i>Thamnophis gigas</i>	FT, ST	FEW, RIC, VRI
Birds			
Bald eagle ^c	<i>Haliaeetus leucocephalus</i>	D, SE	LAC, RIV, VRI
Bank swallow	<i>Riparia</i>	ST	BAR, RIV
Northern spotted owl	<i>Strix occidentalis caurina</i>	FT	DFR, RDW, MHC
Greater sandhill crane ^c	<i>Grus canadensis tabida</i>	ST	FEW, WTM, PAS
Swainson's hawk ^c	<i>Buteo swainsoni</i>	ST	AGS, BOW, VRI, VOW
Western yellow-billed cuckoo	<i>Coccyzus americanus occidentalis</i>	FC, SE	DOR, VRI
Willow flycatcher	<i>Empidonax traillii</i>	SE	VRI, MRI, WTM
Mammals			
Pacific fisher	<i>Martes pennanti pacifica</i>	CST or CSE	MHC, SMC

***Status Key**

FE = Federal Endangered
 FT = Federal Threatened
 FC = Federal Candidate
 D = Delisted
 SE = State Endangered
 ST = State Threatened
 CSE = Candidate State Endangered
 CST = Candidate State Threatened

^bHabitat Key

AGS = Annual grassland
 BAR = Barren
 BOP = Blue oak-foothill pine
 BOW = Blue oak woodland
 DFR = Douglas Fir
 FEW = Freshwater emergent wetland
 LAC = Lacustrine

MHC = Mixed hardwood conifer
 RDW = Redwood
 RIC = Rice
 RIV = Riverine
 SMC = Sierran Mixed Conifer
 VOW = Valley oak woodland
 VRI = Valley/foothill riparian
 WTM = Wet meadow

^cSpecies documented during field surveys.

^dSpecies confirmed as present within Primary Study Area by USFWS.

^eStatus changed from CSE to ST on 03-03-10.

Invertebrates

Conservancy Fairy Shrimp, Vernal Pool Tadpole Shrimp, and Vernal Pool Fairy Shrimp

Fairy and tadpole shrimps are restricted to temporary pools in California. Typical habitat includes vernal pools, ponded areas within vernal swales, rock outcrop ephemeral pools, playas, alkali flats, and salt lakes (Eng et al., 1990). Fairy shrimp are typically absent from permanent water bodies. These shrimp are not abundant in ponds that contain large invertebrate predators, and are rarely found in bodies of water that contain carnivorous fish (Smith, 2001).

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The federally endangered Conservancy shrimp is known to exist in a pool located within ten miles of the Primary Study Area. The federally threatened vernal pool fairy shrimp and the federally endangered vernal pool tadpole shrimp are widespread throughout the Central Valley, and are reported to occur within Glenn and Colusa counties.

The quality of potential habitat found within the proposed reservoir footprint is marginal. Many of the pools do not remain ponded for entire seasons, and some potential habitats do not pond at all. The pools are dominated by non-native vegetative species and are heavily affected by cattle ranching. The soils are alkaline and are unsuitable for many species (Eng et al., 1990, Eriksen and Belk, 1999). Conservancy fairy shrimp, vernal pool fairy shrimp, and vernal pool tadpole shrimp were not identified within the Primary Study Area during protocol-level field surveys.

Valley Elderberry Longhorn Beetle

The federally threatened valley elderberry longhorn beetle (VELB) is endemic to riparian systems along the margins of rivers and streams, occasional seeps, and in adjacent grassy savannas in the Sacramento and San Joaquin valleys. VELB feeds on two species of elderberry shrubs, and the adult females deposit eggs in the crevices of the bark of these plants. Emergence holes are typically observed in shoots or branches of mature healthy plants (Barr, 1991).

The elderberry shrubs within the Primary Study Area are individuals with multiple trunks and range from unhealthy stressed plants to occasional large healthy plants. During protocol-level field surveys, VELB emergence holes were found on 18 (3 percent) of 672 elderberry stems surveyed within the proposed Sites Reservoir footprint, primarily along Grapevine and Antelope creeks. Elderberry shrubs were also surveyed east of the proposed reservoir along Funks Creek, along a previously proposed road route west of the reservoir footprint, and at the proposed Delevan Pipeline Intake/Discharge facilities, but no emergence holes were observed.

Amphibians

California Red-Legged Frog

The federally threatened California red-legged frog is described in the Secondary Study Area discussion (Section 14.3.2.3). The nearest known locations of red-legged frogs to the Primary Study Area are in Butte and Tehama counties, typically in meadow or grassland ponds that are surrounded by pine forest or blue-oak woodland. All water sources within the primary study area are considered suitable, although most ponds contain bullfrogs. The California red-legged frog was not observed within the Primary Study Area during protocol-level field surveys.

California Tiger Salamander

The federally- and State-threatened California tiger salamander is most commonly found in annual grassland habitat, but can also occur in the understory of hardwood habitats. The adults spend most of the year underground, inhabiting the burrows of ground squirrels, gophers, and badgers. This species lays eggs in vernal pools or other temporary ponds that contain submerged and/or emergent vegetation, and will use permanent human-made ponds if predatory fish are absent (Mayer and Laudenslayer, 1988b; Stebbins, 1985).

The nearest known locations of tiger salamanders to the Primary Study Area are in Sacramento and Yolo counties, typically in ponds, vernal pools, or slow-moving creeks surrounded by grassland or oak savanna. The USFWS list does not include this species as potentially occurring in the Primary Study

Area, and Colusa County appears to be outside of its current range. However, the WHR System lists this species as potentially occurring in Colusa County within the habitat types of the Primary Study Area. The California tiger salamander was not observed during protocol-level field surveys within the proposed Sites Reservoir Inundation Area, although potentially suitable habitat exists within the Primary Study Area.

Reptiles

Giant Garter Snake

The federally- and State-threatened giant garter snake is described in the Secondary Study Area discussion (Section 14.2.2.3). Consultation with the USFWS confirmed that giant garter snakes occur within the Primary Study Area, mainly within rice habitat found along portions of Delevan Pipeline.

Birds

Bald Eagle

The federally delisted and State-endangered bald eagle is described in the Secondary Study Area discussion (Section 14.2.2.3). Sporadic winter use by adult and immature bald eagles in the Primary Study Area has been documented. During initial field surveys, no nests, adult pairs, or nesting behavior were observed at any proposed Project facility location. However, during subsequent visits to the Primary Study Area a nesting pair of bald eagles was observed at the proposed Golden Gate Dam site. This pair successfully reproduced in 2008, 2009, 2010, 2011, and 2012.

Bank Swallow

The State-threatened bank swallow is described in the Secondary Study Area discussion (Section 14.2.2.3). The nearest known locations of nesting bank swallows to the Primary Study Area are in Glenn and Colusa counties along the Sacramento River.

The incised channels of virtually all of the streams within the Primary Study Area contain some unvegetated vertical banks, and all streams are ephemeral with only limited ponded water present by June 15 during most years. Sandy or loamy soils are generally absent. Bank swallow surveys along the streams within the Primary Study Area failed to detect any sign of nesting bank swallows.

The Delevan Pipeline Intake/Discharge facilities are proposed to be located on the Sacramento River at River Mile (RM) 158.5 on the right bank. The proposed facility location is geologically stable, with geologic control upstream and downstream along the levee (refer to Chapter 8 Fluvial Geomorphology and Riparian Habitat for a detailed description of this location). Annual bank swallow surveys are conducted along the Sacramento River in June by USFWS, DFG, and DWR personnel. Bank swallow survey data for most years between 2000 and 2009 showing the nearest colony locations to the proposed intake/discharge facility location, as well as the number of burrows in each colony, are presented in Table 14-4.

Table 14-4
Nearest Bank Swallow Colony Locations to the Delevan Pipeline
Intake/Discharge Facilities

Bank Swallow Survey Year	Locations Upstream of Intake/Discharge Facilities		Locations Downstream of Intake/Discharge Facilities	
	Nearest River Mile (Side of Bank)	Estimated Number of Burrows in Colony	Nearest River Mile (Side of Bank)	Estimated Number of Burrows in Colony
2009	161.6 (L)	80	158.1 (L)	103
2008	161.4 (L)	32	157.0 (L)	160
2007	162.6 (L)	250	158.4 (R)	10
2006*				
2005	162.0 (R)	280	157.0 (L)	910
2004	159.0 (R)	100	156.8 (L)	370
2003	162.5 (R)	170	157.0 (L)	50
2002*				
2001	162.1 (R)	240	156.6 (L)	1270
2000	162.7 (L)	280	157.3 (L)	260

*Surveys were not conducted in 2002, and the stretch of the river near the proposed Delevan Pipeline Intake/Discharge facilities was not surveyed in 2006.

Northern Spotted Owl

The federally threatened northern spotted owl occurs throughout the mountainous portions of northwest California, including the extreme western portions of Glenn and Colusa counties. Suitable nesting habitat includes extensive stands (100 to 600 acres) of dense, multilayered, mature or old growth coniferous forest. Although some downslope movement during winter has been observed, little or no use of low-elevation grassland or open oak habitat has been observed in northern California (Mayer and Laudenslayer, 1988c). Suitable nesting and foraging habitat for the northern spotted owl is absent in the vicinity of the Primary Study Area.

Greater Sandhill Crane

The State-threatened greater sandhill crane is described in the Secondary Study Area discussion (Section 14.3.2.3). Within the Primary Study Area, wintering sandhill cranes (possibly greater sandhill cranes) were observed along Sacramento Valley floor habitats, including the Delevan Pipeline and the valley portion of Sulphur Gap Road.

Swainson's Hawk

The State-threatened Swainson's hawk is a migratory raptor present within the Sacramento Valley during the breeding season (March through September). Swainson's hawks use desert, grassland, and cropland where scattered large individual trees or small groves of large trees are present. This species forages primarily over irrigated pasture or croplands. Approximately 80 percent of the estimated statewide population occurs in the Central Valley (DFG, 1993).

Suitable nesting and foraging habitat is present within portions of the Primary Study Area. Foraging Swainson's hawks were observed on the Sacramento Valley floor adjacent to the Sites Reservoir footprint, as well as along the Delevan Pipeline and valley portion of Sulphur Gap Road.

Western Yellow-Billed Cuckoo

The federal candidate and State-endangered western yellow-billed cuckoo is described in the Secondary Study Area discussion (Section 14.2.2.3). Suitable nesting habitat within the Primary Study Area is associated with portions of the Delevan Pipeline and the Delevan Pipeline Intake/Discharge facilities. The mature riparian habitat and adjacent walnut orchards in this area were surveyed intensively for cuckoos during the breeding season, but none were detected during Project surveys.

In 2010, the Point Reyes Bird Observatory, in coordination with USFWS and DFG, conducted yellow-billed cuckoo surveys along the Sacramento River from Red Bluff to Colusa. A total of 18 individual cuckoos were detected ranging from RM 157 to RM 240. The detection locations nearest to the Primary Study Area included one detection at Princeton South (RM 163 - DFG land) and one detection at Moulton Island (RM 157 - private land). Both locations are within Colusa County (Dettling and Howell, 2011).

Willow Flycatcher

The State-endangered willow flycatcher is described in the Secondary Study Area discussion (Section 14.2.2.3). Migrating willow flycatchers are infrequently observed in Glenn or Colusa counties. Willow flycatchers are no longer present as a nesting species within the Central Valley (Remsen, 1978).

The nearest known locations to the Primary Study Area of the willow flycatcher are in Colusa (1973) and Tehama (2009) counties. No willow flycatchers were detected during field surveys within the Primary Study Area, and no suitable willow flycatcher habitat was observed.

Mammals

Pacific Fisher

The Pacific fisher is listed as a State Species of Special Concern and as of 2011 is a candidate for federal protection. This species is known to occur at high elevations in extreme western Glenn and Colusa counties. Fisher habitat includes large areas of mature dense coniferous forests and deciduous-riparian habitat with high percent canopy closures (Mayer and Laudenslayer, 1988d). Coniferous and hardwood forests usually provide these habitat requirements. The fisher also prefers forests with hollow trees, rock crevices, slash piles, and porcupine dens. These habitat features provide suitable denning sites.

Following USFS guidelines for fisher survey methods (Zielinski and Kucera, 1995), field crews determined that suitable fisher habitat is not present within the Primary Study Area. However, track plate and camera station sampling were conducted in areas of marginal habitat that occur only sporadically within the Primary Study Area. These efforts failed to detect fishers.

14.2.3.5 Species of Concern and Fully Protected Species

Forty-five federal and/or State terrestrial wildlife species of special concern may occur within the Primary Study Area. Field surveys resulted in the documentation of 28 of these species (Table 14-5). Life history accounts for these species are provided below.

Table 14-5
Terrestrial Wildlife Species of Special Concern that may Occur in the Primary Study Area

Common Name	Scientific Name	Status ^a	Habitat Association ^b
Amphibians			
Foothill yellow-legged frog ^c	<i>Rana boylei</i>	SC	VRI
Western spadefoot ^c	<i>Spea hammondi</i>	SC	AGS, BOW
Reptiles			
Western pond turtle ^c	<i>Actinemys marmorata</i>	SC	VRI
Birds			
American peregrine falcon	<i>Falco peregrinus anatum</i>	FSC, SFP	AGS, BOW, BOP, VOW
American white pelican ^c	<i>Pelecanus erythrorhynchos</i>	SC	LAC
Barrow's goldeneye	<i>Bucephala islandica</i>	SC	LAC, RIV
Bell's sage sparrow ^c	<i>Amphispiza belli</i>	FSC	CRC, MCH
Black swift	<i>Cypseloides niger</i>	FSC, SC	VOW, BOW, BOP
Black tern ^c	<i>Chlidonias niger</i>	SC	LAC, FEW, IGR, AGS
Burrowing owl ^c	<i>Athene cunicularia</i>	FSC, SC	AGS
Caspian tern ^c	<i>Hydroprogne caspia</i>	FSC	LAC, BAR
Common loon ^c	<i>Gavia immer</i>	SC	LAC
Ferruginous hawk ^c	<i>Buteo regalis</i>	FSC	AGS, FEW, PAS
Golden eagle ^c	<i>Aquila chrysaetos</i>	FSC, SFP	AGS, BOW, FEW
Lawrence's goldfinch ^c	<i>Carduelis lawrencei</i>	FSC	BOW
Least bittern	<i>Ixobrychus exilis</i>	SC	FEW
Lesser sandhill crane ^c	<i>Grus canadensis</i>	SC	FEW, WTM, PAS
Lewis' woodpecker ^c	<i>Melanerpes lewis</i>	FSC	VOW
Loggerhead shrike ^c	<i>Lanius ludovicianus</i>	FSC, SC	AGS
Long-billed curlew ^c	<i>Numenius americanus</i>	FSC	AGS, IRH
Long-eared owl ^c	<i>Asio otus</i>	SC	VRI, AGS, BOW
Mountain plover	<i>Charadrius montanus</i>	FSC, SC	AGS, BAR, IRF, IRH
Northern goshawk	<i>Accipiter gentilis</i>	SC	MHC, JPN, PPN
Northern harrier ^c	<i>Circus cyaneus</i>	SC	AGS, FEW, IGR, IRH
Olive-sided flycatcher	<i>Contopus cooperi</i>	FSC, SC	MHC, JPN
Prairie falcon ^c	<i>Falco mexicanus</i>	FSC	AGS, BOW, BOP, VOW
Purple martin	<i>Progne subis</i>	SC	VRI, BOW, MCH
Redhead ^c	<i>Aythya americana</i>	SC	FEW, LAC
Rufous hummingbird	<i>Selasphorus rufus</i>	FSC	BOW, VOW
Short-eared owl ^c	<i>Asio flammeus</i>	SC	AGS, FEW, IGR
Tri-colored blackbird ^c	<i>Agelaius tricolor</i>	FSC, SC	AGS, FEW
Tule greater white-fronted goose	<i>Anser albifrons elgasi</i>	SC	AGS, FEW, WTM, IGR
Vaux's swift	<i>Chaetura vauxi</i>	SC	VRI, LAC
Western snowy plover	<i>Charadrius alexandrinus nivosus</i>	FSC, SC	LAC
White-tailed kite ^c	<i>Elanus leucurus</i>	SFP	BOW, FEW, AGS, IRH
Yellow-breasted chat	<i>Icteria virens</i>	SC	VRI

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Table 14-5
Terrestrial Wildlife Species of Special Concern that may Occur in the Primary Study Area

Common Name	Scientific Name	Status ^a	Habitat Association ^b
Yellow-headed blackbird ^c	<i>Xanthocephalus xanthocephalus</i>	SC	FEW, WTM
Yellow warbler ^c	<i>Dendroica petechia brewsteri</i>	SC	VRI
Mammals			
American badger ^c	<i>Taxidea taxus</i>	SC	AGS, BOW, VOW
Pallid bat ^c	<i>Antrozous pallidus</i>	SC	AGS, BOW, BOP, VOW
Spotted bat	<i>Euderma maculatum</i>	SC	BOP
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	SC	BOW, BOP, VOW
Western mastiff bat	<i>Eumops perotis californicus</i>	SC	BOW, BOP, VOW
Western red bat ^c	<i>Lasiurus blossevillei</i>	SC	VRI, VOW, BOW

^aStatus Key

FSC = Federal species of concern

SC = State species of special concern

SFP = State fully protected species

^bHabitat Key

AGS = Annual grassland

BAR = Barren

BOP = Blue oak-foothill pine

BOW = Blue oak woodland

CRC = Chamise-redshank chaparral

FEW = Freshwater emergent wetland

GR = Irrigated grain and seed crops

IRH = Irrigated hayfield

JPN = Jeffrey pine

LAC = Lacustrine

MCH = Mixed chaparral

MHC = Mixed hardwood conifer

PAS = Pasture

PPN = Ponderosa pine

RIV = Riverine

VOW = Valley oak woodland

VRI = Valley/foothill riparian

WTM = Wet meadow

^cSpecies documented during field surveys.

Amphibians

Foothill Yellow-Legged Frog

The foothill yellow-legged frog is described in the Secondary Study Area discussion (Section 14.2.2.3). This species is known to occur in southwest and western Colusa County. Although potentially suitable habitat exists, foothill yellow-legged frogs were not observed during extensive field surveys in the Primary Study Area.

Western Spadefoot

The western spadefoot is a toad that ranges throughout the Central Valley and foothills at elevations ranging from near sea level to 1359 m (4,460 ft). This toad is typically found in grasslands with shallow temporary pools, but some populations survive in orchards or vineyards. The western spadefoot spends most of the year in underground burrows. Breeding and egg-laying occurs during winter rains when temporary pools are formed. Eggs are attached to small submerged rocks or plants. Adults move above ground when the rains start, and normally end breeding activities by the end of March. Juveniles leave the breeding ponds in late spring. Adults tend to avoid predation in their underground burrows, but tadpoles are preyed upon by wading birds and some mammals, such as raccoons (Mayer and Laudenslayer, 1988b).

Within the Primary Study Area, one western spadefoot toad was observed during field surveys in grassland habitat along a formerly proposed road route. Although the location is no longer included in the Primary Study Area, it is adjacent to the southern portion of the proposed Sites Reservoir footprint, where similar suitable habitat exists.

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Reptiles

Western Pond Turtle

The western pond turtle is described in the Secondary Study Area discussion (Section 14.2.2.3). Within the Primary Study Area, western pond turtles were observed during field surveys in riparian areas and at ponds along a canal within the Delevan Pipeline route, near Funks Reservoir, within the proposed Sites Reservoir footprint, and at the Sites Dam site.

Birds

American Peregrine Falcon

The peregrine falcon is a very uncommon nesting species within the northern Coast Range. This species generally selects high cliffs near lakes, rivers, or wetlands for nesting. Human-made structures, including tall buildings or bridges, have also been used in California for nesting (Jurek, 1989). During winter, peregrines use a wide variety of habitats including agricultural croplands and annual grasslands for foraging.

The nearest known nesting locations of peregrine falcons to the Primary Study Area are in Butte and Tehama counties, typically on volcanic rock or limestone cliffs surrounded by mixed hardwood conifer habitat. No peregrine falcons were observed within the Primary Study Area during field surveys, and no potentially suitable cliff nest sites exist at any proposed Project facility location.

American White Pelican

Habitat for the American white pelican includes rivers, natural lakes, reservoirs, and larger farm ponds containing fish. Historically, white pelicans nested on large lakes throughout California (Grinnell and Miller, 1944). This species may travel long distances between forage and resting areas. These pelicans are gregarious, and flocks can contain large numbers of individuals.

No pelicans were observed within the proposed Sites Reservoir footprint. Suitable habitat is generally lacking except on the larger farm ponds. Small groups of pelicans were observed on Funks Reservoir during winter and fall. Small numbers of pelicans were observed year round along the proposed Delevan Pipeline route. Most observations of habitat use along this route occurred at the Sacramento River or near the Delevan National Wildlife Refuge (NWR).

Barrow's Goldeneye

Barrow's goldeneye is an uncommon winter visitor to California. No breeding by this secondary cavity nester has been documented within California for many years. Nesting habitat is near alkaline lakes or slow moving rivers with abundant submerged aquatic vegetation and open water. Wintering habitats are riverine and lacustrine waters with rocky bottoms (Mayer and Laudenslayer, 1988c).

No Barrow's goldeneye has been observed within the Primary Study Area. However, a landowner within the proposed Sites Reservoir footprint reported the presence of a single Barrow's goldeneye within an ephemeral stock pond during winter 1998. This report was not confirmed. No suitable nesting habitat currently exists within the Primary Study Area. Potentially suitable wintering habitat is present at Funks Reservoir and along portions of the proposed Delevan Pipeline route.

Bell's Sage Sparrow

The Bell's sage sparrow is a subspecies of the common sage sparrow. This species occurs year round in western Glenn and Colusa counties where it frequents dense chaparral stands dominated by chamise

(Mayer and Laudenslayer, 1988c). Sage sparrows are absent from the proposed Sites Reservoir footprint. However, a sage sparrow was observed in suitable chaparral habitat along a formerly proposed road route, which is adjacent to the southern portion of the proposed Sites Reservoir footprint. Similar chaparral habitat occurs within or adjacent to several of the Recreation Areas.

Black Swift

The black swift is a migratory species that has very specific habitat requirements for nesting. This species nests on cliffs and frequently occurs in moist microhabitats including behind or adjacent to waterfalls (Mayer and Laudenslayer, 1988c).

The nearest occurrences of black swifts to the Primary Study Area are generally restricted to the eastern edge of Tehama County in the Sierra Nevada. No black swifts were detected during the field surveys, and potentially suitable nesting habitat is absent from the Primary Study Area.

Black Tern

The black tern is a migratory species that occurs in the Central Valley portion of Glenn and Colusa counties. Black terns use lakes, ponds, rivers, wetlands, moist grassland, and agricultural habitats. It is unknown if this species currently breeds within the Sacramento Valley (Mayer and Laudenslayer, 1988c).

No black tern habitat use was observed within the proposed Sites Reservoir footprint. The proposed Delevan Pipeline route was the only Project feature where black terns were observed, with most use associated with foraging birds over flooded rice fields. No black tern use was observed at Funks Reservoir, which provides potentially suitable foraging habitat.

Burrowing Owl

The western burrowing owl is a semi-colonial year-round resident that uses grassland habitats and a variety of early successional stages of open shrub and forest vegetative types where suitable burrows and perches are present. The burrowing owl uses old burrows of ground squirrels or other small mammals, or may dig its own burrow in soft soil, for roosting and nesting cover (Mayer and Laudenslayer, 1988c).

Small scattered groups of burrowing owls were detected within the proposed Sites Reservoir footprint during diurnal avian line transect sampling. Most of these observations were in upland settings near the grassland/blue oak habitat edge. However, a few individual sightings were made in open grassland habitat along stream channels. Sampling with pre-recorded calls was useful for determining the presence of burrowing owls. Responses were received at 42 percent of the call locations within the proposed Sites Reservoir footprint, indicating wide distribution at this location. Burrowing owls were also detected during winter and fall along a formerly proposed road route, which is adjacent to Road 69 and the North Road.

Caspian Tern

The Caspian tern is common to very common along the California coast and at scattered locations inland from April through early August. This species winters in Southern California, and nests in colonies in the San Francisco, San Pablo, Humboldt, and San Diego bays. The Caspian tern feeds primarily on small fish in freshwater lakes, estuaries, and salt ponds (Mayer and Laudenslayer, 1988c).

Within the primary study area, Caspian terns were observed along the Delevan Pipeline route. Potentially suitable foraging habitat exists at Funks Reservoir.

Common Loon

The common loon has an inland distribution that is extremely irregular and associated with large natural lakes and some reservoirs. This uncommon wintering species requires deep freshwater lakes with adequate small food fish (Mayer and Laudenslayer, 1988c).

Common loons were observed only at Funks Reservoir and only during spring and fall migration. Individual loons were observed on Funks Reservoir on two occasions. Funks Reservoir represents the only lacustrine habitat within the Primary Study Area, excluding some of the larger farm ponds.

Ferruginous Hawk

The ferruginous hawk is a relatively uncommon winter migrant. Ferruginous hawks are present in the Sacramento Valley from September through mid-April and use large tracts of open grasslands for winter foraging habitat (Mayer and Laudenslayer, 1988c).

Within the Primary Study Area, sporadic individual sightings of wintering ferruginous hawks were made within the proposed Sites Reservoir footprint.

Golden Eagle

The golden eagle nests throughout northern California, with the exception of the dense forests along the North Coast. Extensive wintering use of the Sacramento Valley can occur. This species forages in open habitats including grasslands, savannas, and early successional stages of open shrub and tree habitats (Mayer and Laudenslayer, 1988c).

The golden eagle is one of the most common large raptors year round within the Primary Study Area. Several active golden eagle nests were identified around the proposed Sites Reservoir rim areas, including nesting activity in, or near, three of the five proposed Recreation Areas. Golden eagle densities varied, with the highest density recorded during the winter. The highest densities associated with any proposed Project features were spring and fall densities on a formerly proposed road route, which is southeast of the proposed Sites Reservoir footprint. Along the proposed Delevan Pipeline route, golden eagles were recorded only during winter and only along the western end of the route where agricultural croplands meet the foothills.

Lawrence's Goldfinch

The Lawrence's goldfinch primarily occurs in Glenn and Colusa counties during the breeding season (March through September). Limited wintering use has been observed. This species breeds and forages in open oak or shrub habitats near water (Mayer and Laudenslayer, 1988c).

Lawrence's goldfinches were observed only sporadically within the Primary Study Area, although suitable nesting habitat exists. Observations were made in the reservoir footprint, at Funks Reservoir, and along a formerly proposed road route, which is southwest of the proposed Sites Reservoir footprint. Lawrence's goldfinches were frequently encountered in mixed flocks with other goldfinches. Only rarely were individuals of this species encountered, even during the breeding season.

Least Bittern

The least bittern occurs along the Sacramento River in eastern Glenn and Colusa counties from April through September. Least bitterns use dense emergent wetland vegetation for reproduction and foraging (Mayer and Laudenslayer, 1988c).

No least bitterns were detected within the Primary Study Area. Adequate amounts of suitable habitat for this reclusive species are present along portions of the proposed Delevan Pipeline route. Some of the farm ponds and roadside ditches within the proposed Sites Reservoir footprint have a limited amount of emergent vegetation present. However, adequate amounts of potentially suitable habitat for this species are absent from all proposed Project features.

Lesser Sandhill Crane

Lesser sandhill cranes do not breed in California, but winter mainly in the Central Valley, including areas of Glenn and Colusa counties west of the Sacramento River. Winter habitat consists of annual and perennial grasslands, moist croplands (corn, sorghum, barley, and rice), or emergent wetlands (Mayer and Laudenslayer, 1988c).

Within the Primary Study Area, wintering sandhill cranes (possibly lesser sandhill cranes) were observed along Sacramento Valley floor habitats, including the Delevan Pipeline route and the valley portion of Sulphur Gap Road.

Lewis' Woodpecker

The Lewis' woodpecker was not identified as a special-status species when field surveys began. Lewis's woodpecker occurs year round in western Glenn and Colusa counties. Preferred habitat includes open oak and conifer habitats that have snags with cavities (Mayer and Laudenslayer, 1988c).

This woodpecker occurred infrequently within the proposed Sites Reservoir footprint during spring and fall, as well as along the North and Sulphur Gap roads. Suitable habitat is generally lacking in the northern portion of the proposed reservoir area. No summer use was recorded.

Loggerhead Shrike

The loggerhead shrike occurs in open habitats with infrequent perch sites (trees, shrubs, fences, and power lines). Loggerhead shrikes forage over open sparse, low herbaceous cover. This territorial species occurs yearlong in Glenn and Colusa counties with resident and migrants present during the winter (Mayer and Laudenslayer, 1988c).

The loggerhead shrike is one of the more common and widespread avian species in grassland habitats within the Primary Study Area. This shrike's abundance appears to decrease rapidly with increasing tree density. Loggerhead shrike densities varied within the proposed Sites Reservoir footprint.

Long-Billed Curlew

The long-billed curlew winters in the Sacramento Valley. This large shorebird uses a variety of open habitats in the Sacramento Valley during the winter including croplands, mudflats, flooded areas, and open grasslands (Mayer and Laudenslayer, 1988c).

Long-billed curlews were present sporadically within the proposed Sites Reservoir footprint throughout the winter and spring. Large flocks were occasionally encountered foraging in the grassland habitats when the soils were at or near saturation. Extensive use of vernal pool areas was also observed. All curlew observations at Funks Reservoir were of birds foraging in exposed mudflats. The grasslands surrounding Funks Reservoir are ungrazed, relatively tall, dense, and apparently unsuitable for curlew foraging habitat. Curlew use along the proposed Delevan Pipeline route occurred in flooded rice fields and within annual grassland habitats along the westernmost end of the proposed route. The long-billed curlew was also observed along Sulphur Gap Road, as well as within the Saddle Dam Recreation Area.

Long-Eared Owl

The long-eared owl occurs year round in valley and foothill locations in Glenn and Colusa counties. Preferred nesting habitat is reported as dense riparian and live oak stands near open areas or forest/grassland edges (Mayer and Laudenslayer, 1988c).

Long-eared owls were observed regularly at a single location along the proposed Delevan Pipeline route during summer. Although no long-eared owls were detected along diurnal transect routes, nocturnal censusing with prerecorded taped calls indicate that long-eared owls are common along the blue oak/grassland edge habitats within the Primary Study Area. Long-eared owl responses were obtained at 54 percent of the half-mile segments sampled within the proposed Sites Reservoir footprint. This species appears to be less common in extensive open grassland habitats. However, an active nesting pair of long-eared owls was observed 0.5 mile northeast of the proposed Sites Reservoir footprint in an isolated cottonwood tree in grassland habitat.

Mountain Plover

The mountain plover is a winter resident in California, typically found on short open grasslands and plowed fields with little vegetation (Mayer and Laudenslayer, 1988c). This species is known to occur in southeast Colusa County.

No mountain plovers were observed within the Primary Study Area, but potentially suitable habitat exists at many of the proposed Project facility locations.

Northern Goshawk

The northern goshawk is an uncommon year-round resident that frequents mid- to high-elevation mature dense coniferous forests for reproduction. Some limited winter use of low-elevation foothill riparian habitat has been documented (Mayer and Laudenslayer, 1988c). This species is known from the higher elevations of Glenn and Butte counties.

No goshawks were encountered during avian transect sampling within the Primary Study Area. Further, potentially suitable nesting habitat is not present at this low elevation.

Northern Harrier

The northern harrier is a common year-round resident that uses a variety of open habitats including meadows, wetlands, and annual and perennial grasslands. This species seldom uses forest or woodland habitats, although some forest/grassland edge habitats are used. Agricultural habitats that mimic tall dense grasslands or freshwater emergent vegetation types are also used as foraging habitats (Mayer and Laudenslayer, 1988c).

Northern harriers were observed at all Project features. Northern harriers are a relatively common species in the proposed Sites Reservoir footprint during fall, spring, and winter. Relatively minor summer use has been documented within the proposed reservoir footprint. Relatively high densities have been documented at Funks Reservoir and along the proposed Delevan Pipeline route.

Olive-Sided Flycatcher

The olive-sided flycatcher occurs in western Glenn and Colusa counties. Preferred habitat includes mixed conifer, montane hardwood conifer, Douglas fir, redwood, red fir, and lodgepole pine. It is most common in forested habitats near open terrain (Mayer and Laudenslayer, 1988c).

Olive-sided flycatchers were not observed within the Primary Study Area, and potentially suitable habitat is generally absent at this low elevation.

Prairie Falcon

The prairie falcon nests in inland portions of the northern Coast Range, and winters in that area as well as within the Sacramento Valley. Preferred nesting habitat is a variety of open habitats (primarily perennial grasslands, savannas, rangeland, or open agricultural types) with a nearby sheltered cliff ledge. Winter migrants use a variety of open habitats (Mayer and Laudenslayer, 1988c).

Individual prairie falcons are occasionally present at the proposed Sites Reservoir footprint during winter and fall, but densities are generally low. The seasonal occurrence of this species suggests that breeding does not occur in the Primary Study Area. Prairie falcons were observed at Funks Reservoir and along the Delevan Pipeline and Sulphur Gap Road. A single prairie falcon was also sighted within the Antelope Island Recreation Area.

Purple Martin

The purple martin is a migratory species that returns to northern California during March and migrates south during September. A variety of habitat types are used for reproduction in the Coast Range including hardwood and coniferous habitats. Preferred breeding habitat includes open older forests and woodlands with suitable snags for nesting. This species forages for insects over a variety of habitats near the nest site including forest, woodland, chaparral, and riparian habitats (Mayer and Laudenslayer, 1988c). This species is known from Lake and Shasta counties.

Potential breeding habitat is generally absent from the Primary Study Area, and no purple martins were observed during field surveys.

Redhead

The redhead is found year round in the Central Valley. This species nests in fresh emergent wetlands where dense stands of cattails and tules border open water (Mayer and Laudenslayer, 1988c). Redheads are known to occur in eastern Glenn and Colusa counties.

Within the Primary Study Area, redheads were observed at Funks Reservoir, and suitable habitat exists at the duck clubs along the proposed Delevan Pipeline route.

Rufous Hummingbird

The rufous hummingbird is a common migrant and uncommon summer resident in California. This hummingbird is found in a variety of habitats that provide nectar-producing flowers, including riparian, open woodland, and chaparral habitats. Breeding occurs only in Trinity and Humboldt counties, but spring migration occurs mostly in the lowlands and foothills (Mayer and Laudenslayer, 1988c).

Rufous hummingbirds were not observed within the Primary Study Area, but could occur during migration.

Short-Eared Owl

The short-eared owl occurs in open habitats with dense vegetation, including annual and perennial grasslands, irrigated pasture, and fresh emergent wetlands. Forest and woodland areas are avoided (Mayer and Laudenslayer, 1988c).

Short-eared owls were observed during diurnal avian line transects at Funks Reservoir and along the proposed Delevan Pipeline route only. No summer use was recorded at any proposed Project facility location. Short-eared owls were regularly observed along the proposed Delevan Pipeline route in the vicinity of Delevan NWR in winter. Nocturnal owl calling identified the presence of a short-eared owl at two locations along the proposed Delevan Pipeline route.

Tricolored Blackbird

The tricolored blackbird is a colonial year-round resident of the Sacramento Valley that uses freshwater emergent wetland habitats (primarily cattail and tules) for nesting. This blackbird forages on the ground in a variety of habitats including grasslands, croplands, and seasonally flooded areas. Tricolored blackbirds may travel many miles between nesting and foraging areas (Mayer and Laudenslayer, 1988c).

Foraging tricolored blackbirds were commonly observed within open grassland habitats within the proposed Sites Reservoir footprint, as well as along the North and Sulphur Gap roads, at Funks Reservoir, and within the Saddle Dam Recreation Area. Although no nesting was observed within the Primary Study Area, suitable nesting habitat is present within the Delevan NWR near the proposed Delevan Pipeline route. Tricolored blackbirds frequently occurred in mixed flocks with Brewer's blackbirds, red-winged blackbirds, and European starlings.

Tule Greater White-Fronted Goose

The tule greater white-fronted goose winters in California's Central Valley, where it prefers wetlands dominated by tules, rushes, and cattails. This species also forages in agricultural fields, including rice fields (Shuford and Gardali, 2008). Tule greater white-fronted geese are known to occur in southeastern Glenn County and northeastern Colusa County, mainly on State and federal managed wetlands, but also on private wetlands managed for waterfowl hunting.

No tule greater-white fronted geese were observed within the Primary Study Area, but potentially suitable habitat exists along the proposed Delevan Pipeline route.

Vaux's Swift

The Vaux's swift is frequently observed in northern California during migration and less often during the breeding season. No winter use occurs. Preferred nesting habitat includes an appropriate nest site in a large hollow tree, primarily redwood or Douglas fir. This swift may also nest in chimneys or buildings. Vaux's swifts forage in flight for insects over many habitat types near the nest tree, including riparian and lacustrine habitat (Mayer and Laudenslayer, 1988c).

No Vaux's swifts were observed within the Primary Study Area.

Western Snowy Plover

The western snowy plover occurs year round along the California coast with a very limited summer distribution inland. Central Valley records are primarily from the San Joaquin Valley. This species frequents sandy or gravelly beaches of estuarine salt ponds or alkali lakes for foraging and nesting (Mayer and Laudenslayer, 1988c).

No western snowy plover were identified within the Primary Study Area. However, potentially suitable habitat is present along the proposed Delevan Pipeline route.

White-Tailed Kite

The white-tailed kite is found year round throughout the Sacramento Valley and adjacent foothill areas. Habitat preference includes open or herbaceous stages of most low-elevation vegetative types, primarily grasslands, meadows, farmland, and emergent wetlands. However, white-tailed kites are frequently associated with agricultural areas. Dense stands of trees are used as communal night roost sites (Mayer and Laudenslayer, 1988c).

White-tailed kites were an uncommon species within the proposed Sites Reservoir footprint. However, one pair of nesting kites was observed in open blue oak habitat near the southern end of the proposed Sites Reservoir in 1999. This species was commonly observed in cropland habitat downstream from Funks Reservoir and less frequently foraging the ungrazed grasslands around Funks Reservoir. Kites were observed along the length of the proposed Delevan Pipeline route, with the greatest habitat use associated with irrigated pasture or croplands as opposed to the more commonly occurring rice fields. Kites were also observed along Sulphur Gap Road. No communal roost trees were identified.

Yellow-Breasted Chat

The yellow-breasted chat, an uncommon warbler, is a migratory species that arrives in California during April and departs by October. Nesting habitats consist of dense riparian understory and other dense shrub habitats near water. Willow and blackberry patches are used extensively (Mayer and Laudenslayer, 1988c).

No yellow-breasted chats were observed within the Primary Study Area. Potentially suitable nesting habitat is generally absent except for a narrow strip of mature riparian habitat along the Sacramento River portion of the proposed Delevan Pipeline route.

Yellow-Headed Blackbird

The yellow-headed blackbird nests in fresh emergent wetland with dense vegetation and deep water, often along borders of lakes or ponds. This species forages in emergent wetland and moist open areas, especially in cropland and the muddy shores of lacustrine habitat (Mayer and Laudenslayer, 1988c). The yellow-headed blackbird is known to breed in Colusa County, including areas of the Delevan NWR.

This species was observed within the Primary Study Area at Funks Reservoir and along the proposed Delevan Pipeline route.

Yellow Warbler

The yellow warbler occurs in a variety of woodland and forest habitats in northern California during the breeding season (April through September). This species prefers open to moderate density forests or woodlands with a dense shrub understory. Yellow warblers are most common in open canopy riparian deciduous habitat (Mayer and Laudenslayer, 1988c).

Yellow warblers are a very uncommon species within the Primary Study Area. Sightings within the proposed Sites Reservoir footprint were restricted to spring in a short reach of riparian habitat between the community of Sites and the Sites Damsite. Habitat use along the proposed Delevan Pipeline route primarily occurred in the vicinity of the Colusa Basin Drain (CBD) and the Delevan NWR.

Mammals

American Badger

The American badger is an uncommon permanent resident found throughout most of California, except for the northern North Coast area. It is most abundant in the drier open stages of most shrub, forest, and herbaceous habitats with friable soils. Cultivated lands have been reported to provide little usable habitat for this species. The badger digs burrows in friable (“crumbly”) soil types for cover and remains underground during the day. The badger frequently reuses old burrows, although it has been known to dig a new den each night, especially in summer (Messick and Hornocker, 1981; Mayer and Laudenslayer, 1988d).

Field surveys documented the American badger in grassland and oak woodland areas at Funks Reservoir, within the proposed Sites Reservoir footprint, at all proposed Recreation Areas, and along portions of all roads. Possible suitable habitat exists at all other proposed Project facility locations.

Pallid Bat

The pallid bat occurs throughout California, except in the high Sierra Nevada from Shasta to Kern counties, and the northwestern portion of California in Del Norte and western Siskiyou counties (Mayer and Laudenslayer, 1988d). This bat inhabits a variety of habitats, including grasslands, shrublands, woodlands, and forests, from sea level up through mixed coniferous forests below 2438 m (8,000 ft). In California, the pallid bat is associated with oak woodlands at lower elevations, and may roost in a variety of places including tree cavities, rock crevices, and human-made structures. The pallid bat prefers roosts where it can be out of sight and wedged into small tight crevices. Such sites include rock crevices, bridges, caves, mines, and hollow trees. The pallid bat uses these roosts in tight spaces to thermoregulate, especially during cooler weather. However, during warmer weather periods, it will roost in open areas, such as the sides of rafters and open barns. Barns seem to be a preferred roost. Breeding occurs from October to February, and young are born from May to June. The young are capable of flight at six weeks of age (Davis and Schmidly, 1947).

Field surveys documented the presence of the pallid bat in the grassland and oak woodland habitat within the proposed Sites Reservoir footprint and along the formerly proposed North and Sulphur Gap roads. A maternity roost was discovered in an abandoned ranch house near the North Road. Possible suitable habitat exists at all other proposed Project facility locations.

Spotted Bat

The spotted bat was thought to be found primarily in the southeastern Sierra foothills, mountains, and desert regions, but range expansions have been documented to include Ventura, Riverside, Mariposa, Kern, San Bernardino, San Diego, Fresno, Inyo, Shasta, Siskiyou, Tehama, Tuolumne, Mono, and Tulare counties (Pierson and Rainey, 1998a). Horizontal rock crevices provide optimal roost sites, although the spotted bat may occasionally also use caves and buildings. The spotted bat is apparently a solitary animal. It mates in the fall, with a single pup born before mid-June. Lactating females have been found from June to August (Mayer and Laudenslayer, 1988d).

Due to the rare nature of this animal and minimal information about its range, it has been included as a potentially occurring species. Field surveys failed to document the presence of the spotted bat within the Primary Study Area.

Townsend's Big-Eared Bat

The Townsend's big-eared bat is found throughout California, in all but subalpine and alpine habitats (Mayer and Laudenslayer, 1988d). Suitable roosting sites are restricted to caves and cave-like structures, such as tunnels, mines, and buildings, where this species roosts in the open, rather than in crevices (Pierson and Rainey, 1998b). Hibernation occurs from October to April. Females return to their natal group every spring, and young are born from May to June. One young is born per year and can fly by three weeks of age. Young are typically weaned at six weeks of age. This species is extremely sensitive to disturbance of roosting sites (Mayer and Laudenslayer, 1988d).

Field surveys failed to document the presence of Townsend's western big-eared bat within the Primary Study Area.

Western Mastiff Bat

The western mastiff bat is an uncommon resident ranging from Monterey County southward through southern California, and from the coast eastward to the Colorado Desert. This species occurs in semi-arid to arid habitats, including deciduous woodlands and annual and perennial grasslands (Mayer and Laudenslayer, 1988d). It primarily roosts in crevices in vertical cliffs of granite or consolidated sandstone, and in broken terrain with exposed rock faces (Dalquest, 1946). It is also occasionally found in high buildings (Howell and Little, 1920), trees, and tunnels. Roost sites may change from season to season. Due to its large size, this bat needs vertical faces to drop from to take flight. The western mastiff bat mates in the months surrounding the early spring, and one young is born between April and September (Mayer and Laudenslayer, 1988d).

No western mastiff bats were documented on Anabat recordings or during field surveys within the Primary Study Area.

Western Red Bat

The western red bat is locally common in some areas of California, occurring from Shasta County to the Mexican border, west of the Sierra Nevada/Cascade crest and deserts. The winter range includes western lowlands and coastal regions south of San Francisco Bay. This species is considered to be highly migratory, with migration occurring between summer and winter ranges. The western red bat roosts primarily in the foliage of trees or shrubs. Day roosts are commonly in edge habitats adjacent to streams or open fields, in orchards, and sometimes in urban areas. There may be an association with intact riparian habitat (particularly willows, cottonwoods, and sycamores). This species feeds on insects over a wide variety of habitats, including grasslands, shrublands, open woodlands, and forests. Red bats have been observed feeding around street lights and flood lights. Mating occurs in August and September, and young are born from late May through early June (Mayer and Laudenslayer, 1988d).

During surveys within the Primary Study Area, a juvenile male and juvenile female western red bat were captured along Sulphur Gap Road, immediately adjacent to the southern end of the proposed Sites Reservoir footprint. This species was captured in blue oak woodland habitat; similar suitable habitat exists in the proposed Sites Reservoir footprint, all Recreation Areas with the exception of Saddle Dam, and along portions of most of the roads.

14.2.3.6 Commercially or Recreationally Important Wildlife Species

Up to 58 harvest species (33 birds, 24 mammals, and 1 amphibian) may be found within the Primary Study Area (DFG, 2008a) (Table 14-6).

Wild pigs, and to a lesser extent black bear and mule deer, are important big game species within Colusa and Glenn counties. Field personnel often encountered hunters while conducting wildlife surveys. Detailed information is not available specifically for the Primary Study Area, but figures are available and presented at the county level. During the 2008 hunting season, 56 black bears were reported killed within Colusa and Glenn counties by licensed hunters, representing 2.8 percent of California's total bear harvest for the year (DFG, 2009c). A reported 307 mule deer were killed within Colusa and Glenn counties by licensed hunters, representing 1.9 percent of California's total deer harvest for the year (DFG, 2009d). During the 2006-2007 wild pig hunting season, a reported 374 wild pigs were killed within Colusa and Glenn counties by licensed hunters, representing 8.2 percent of California's total pig harvest for the year (DFG, 2007a).

Table 14-6
Commercially or Recreationally Important Wildlife Species that may Occur
within the Primary Study Area

Common Name	Scientific Name
Harvested Amphibians	
Bullfrog*	<i>Rana catasbeiana</i>
Harvested Birds	
American coot*	<i>Fulica Americana</i>
American crow*	<i>Corvus brachyrhynchos</i>
American wigeon*	<i>Anas Americana</i>
Band-tailed pigeon	<i>Columba fasciata</i>
Blue-winged teal*	<i>Anas discors</i>
Bufflehead*	<i>Bucephala albeola</i>
California quail*	<i>Callipepla californica</i>
Canada goose*	<i>Branta Canadensis</i>
Canvasback*	<i>Aythya valisineria</i>
Cinnamon teal*	<i>Anas cyanoptera</i>
Common goldeneye*	<i>Bucephala clangula</i>
Common merganser*	<i>Mergus merganser</i>
Common moorhen*	<i>Gallinula chloropus</i>
Eurasian wigeon	<i>Anas Penelope</i>
Gadwall*	<i>Anas strepera</i>
Greater white-fronted goose*	<i>Anser albifrons</i>
Green-winged teal*	<i>Anas crecca</i>
Hooded merganser*	<i>Lophodytes cucullatus</i>
Lesser scaup*	<i>Aythya affinis</i>
Mallard*	<i>Anas platyrhynchos</i>
Mountain quail	<i>Oreortyx pictus</i>
Mourning dove*	<i>Zenaida macroura</i>
Northern pintail*	<i>Anas acuta</i>
Northern shoveler*	<i>Anas clypeata</i>
Redhead*	<i>Aythya Americana</i>
Ring-necked duck*	<i>Aythya collaris</i>

PRELIMINARY – SUBJECT TO CHANGE

Table 14-6
Commercially or Recreationally Important Wildlife Species that may Occur
within the Primary Study Area

Common Name	Scientific Name
Ring-necked pheasant*	<i>Phasianus colchicus</i>
Ross's goose	<i>Chen rossii</i>
Ruddy duck*	<i>Oxyura jamaicensis</i>
Sooty grouse	<i>Dendragapus fuliginosus</i>
Snow goose*	<i>Chen caerulescens</i>
Wild turkey*	<i>Meleagris gallopavo</i>
Wood duck*	<i>Aix sponsa</i>
Harvested Mammals	
American badger*	<i>Taxidea taxus</i>
American beaver*	<i>Castor Canadensis</i>
American mink	<i>Mustela vison</i>
Black bear*	<i>Ursus americanus</i>
Black-tailed jackrabbit*	<i>Lepus californicus</i>
Bobcat*	<i>Felis rufus</i>
Brush rabbit*	<i>Sylvilagus bachmani</i>
Common muskrat*	<i>Ondatra zibethicus</i>
Coyote*	<i>Canis latrans</i>
Desert cottontail	<i>Sylvilagus audubonii</i>
Eastern fox squirrel	<i>Sciurus niger</i>
Elk	<i>Cervus elaphus</i>
Ermine	<i>Mustela ermine</i>
Gray fox*	<i>Urocyon cinereoargenteus</i>
Long-tailed weasel	<i>Mustela frenata</i>
Mule deer*	<i>Odocoileus hemionus</i>
Pronghorn	<i>Antilocapra Americana</i>
Raccoon*	<i>Procyon lotor</i>
Red fox*	<i>Vulpes</i>
Striped skunk*	<i>Mephitis</i>
Virginia opossum*	<i>Didelphis virginiana</i>
Western gray squirrel*	<i>Sciurus griseus</i>
Western spotted skunk	<i>Spilogale gracilis</i>
Wild pig*	<i>Sus scrofa</i>

*Species documented during field surveys.

The Delevan NWR and several private duck clubs along the eastern portion of the Delevan Pipeline route provide seasonal waterfowl and pheasant hunting opportunities.

Thirteen of the 58 harvest species that could occur within the Primary Study Area were not observed during field surveys: the Ross' goose, Eurasian wigeon, sooty grouse, mountain quail, band-tailed pigeon, desert cottontail, Eastern fox squirrel, long-tailed weasel, American mink, ermine, western spotted skunk, pronghorn, and elk.

PRELIMINARY – SUBJECT TO CHANGE

Southwestern Colusa County includes a large portion of the management unit for the free-ranging Cache Creek Tule elk herd, which is estimated at a minimum of 187 animals. Two sub-herds frequent the Colusa County portion of the management area, which is southwest of the Primary Study Area. The range of these sub-herds has not been documented to include the Primary Study Area. The East Park Reservoir Tule elk herd, which is estimated at a minimum of 95 animals, is located west of the Primary Study Area. This herd tends to stay within 2 miles of East Park Reservoir and has not been documented within the Primary Study Area, but the hunt zone for this herd overlaps with the northern half of the footprint of the proposed Sites Reservoir, as well as with the Stone Corral, Peninsula Hills, and Saddle Dam recreation areas, Funks Reservoir, Holthouse Reservoir, most roads (excluding Sulphur Gap, Com, and Lurline roads), and portions of the Delevan Pipeline and T-C and GCID canals (Hobbs, pers. comm., 2010).

A small herd of pronghorn is present in Glenn County, north of the Primary Study Area. This herd was incidentally observed several times by field personnel, including along Maxwell Sites Road and Road 68, but their range has not been documented to include the footprint or construction disturbance area of facilities included in the Primary Study Area.

The remaining 11 unobserved wildlife species were not the focus of survey efforts. Suitable habitat exists for each, so it is, therefore, possible that they are present within the Primary Study Area.

14.3 Environmental Impacts/Environmental Consequences

14.3.1 Regulatory Setting

Terrestrial biological resources are regulated at the federal, State, and local levels. Provided below is a list of the applicable regulations. These regulations are discussed in detail in Chapter 4 Environmental Compliance and Permit Summary of this EIR/EIS.

14.3.1.1 Federal Plans, Policies, and Regulations

- National Environmental Policy Act
- Central Valley Project Improvement Act
- Federal Endangered Species Act
- Fish and Wildlife Coordination Act
- Executive Order 11312: Invasive Species
- Migratory Bird Treaty Act
- Bald and Golden Eagle Protection Act

14.3.1.2 State Plans, Policies, and Regulations

- California Environmental Quality Act
- California Endangered Species Act
- California Fish and Game Code Sections 3503, 3503.5, 3511, 4700, and 5050

14.3.1.3 Regional and Local Plans, Policies, and Regulations

- Glenn County General Plan
- Colusa County General Plan
- Colusa County Voluntary Oak Woodlands Management Plan

14.3.2 Evaluation Criteria and Significance Thresholds

Significance criteria represent the thresholds that were used to identify whether an impact would be significant. Appendix G of the *CEQA Guidelines* suggests the following evaluation criteria for biological resources:

Would the Project:

- Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Game (DFG) or U.S. Fish and Wildlife Service (USFWS)?
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by DFG or USFWS?
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites?
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance?
- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), Natural Community Conservation Plan (NCCP), or other approved local, regional, or state HCP?

The evaluation criteria used for this impact analysis represent a combination of the Appendix G criteria and professional judgment that considers current regulations, standards, and/or consultation with agencies, knowledge of the area, and the context and intensity of the environmental effects, as required pursuant to NEPA. For the purposes of this analysis, an alternative would result in a significant impact if it would result in any of the following:

- A substantial adverse effect, including mortality, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by DFG or USFWS.
- A substantial adverse effect, including alteration of habitat suitability, on any wildlife habitat, especially riparian habitat or other sensitive natural communities identified in local or regional plans, policies, regulations, or by DFG or USFWS.
- Substantial interference with the movement of any native resident or migratory wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Indirect effects on common wildlife from human disturbance.
- Conflict with the provisions of an adopted HCP, NCCP, or other approved local or regional HCP, or conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.

14.3.3 Impact Assessment Assumptions and Methodology

14.3.3.1 Assumptions

The following assumptions were made regarding Project-related construction, operation, and maintenance impacts to terrestrial biological resources:

- Direct Project-related construction, operation, and maintenance activities would occur in the Primary Study Area.
- Direct Project-related operational effects would occur in the Secondary Study Area.
- The only direct Project-related construction activity that would occur in the Secondary Study Area is the installation of an additional pump into an existing bay at the Red Bluff Pumping Plant.
- The only direct Project-related maintenance activity that would occur in the Secondary Study Area is the sediment removal and disposal at the two intake locations (i.e., GCID Canal Intake and Red Bluff Pumping Plant).
- No direct Project-related construction or maintenance activities would occur in the Extended Study Area.
- Direct Project-related operational effects that would occur in the Extended Study Area are related to San Luis Reservoir operation; increased reliability of water supply to agricultural, municipal, and industrial water users; and the provision of an alternate Level 4 wildlife refuge water supply. Indirect effects to the operation of certain facilities that are located in the Extended Study Area, and indirect effects to the consequent water deliveries made by those facilities, would occur as a result of implementing the alternatives.
- The existing bank protection located upstream of the proposed Delevan Pipeline Intake/Discharge facilities would continue to be maintained and remain functional.
- No additional channel stabilization, grade control measures, or dredging in the Sacramento River at or upstream of the Delevan Pipeline Intake or Discharge facilities would be required.
- Borrow areas for dam construction materials would be located within the proposed Sites Reservoir footprint, or materials would be obtained from commercial sources outside of the Primary Study Area.
- Frequent Sites Reservoir water level fluctuations would create a barren drawdown zone.
- For all Project facilities that do not have a defined construction disturbance area, an additional 10 percent of the facility footprint acreage is assumed to be the size of the associated disturbance area.
- Periodic maintenance of the proposed pipelines and transmission lines would be conducted on foot and/or by using established roads for vehicle access, and would not require vehicle access over established or restored vegetation.

14.3.3.2 Methodology

Impacts to common wildlife were assessed in relation to habitat alteration or destruction. Direct wildlife impacts include permanent loss of habitat, mortality, injury, displacement, disruption of travel corridors,

and disturbance. Indirect wildlife impacts include disturbance activities that result indirectly from the Project (i.e., increased vehicle traffic, increased foot traffic, and noise), as well as changes to habitat suitability. Analysis of the impacts of human disturbance to common wildlife included consideration of the impacts of human disturbance to special-status wildlife species. Impacts can be positive or negative, and can be short-term (temporary) or long-term (permanent).

Approximately 15 percent of the total footprint of each Recreation Area would be subject to permanent construction disturbance. Because the exact location and area affected by the construction of the recreation facilities within the Recreation Areas is not known, the extent of permanent habitat loss was estimated by applying a 15 percent multiplier to each habitat type present.

Of the 200-foot-wide total construction disturbance area associated with road construction, an approximate average of 60 feet (30 percent) would result in the permanent loss of wildlife habitats. A 30 percent multiplier was, therefore, applied to each habitat type present.

For the Delevan Transmission Line, a worst-case scenario of 70 transmission towers with a concrete pad for a base along the entire length of the transmission line was used to calculate the area of permanent disturbance for Alternatives A and C. A worst-case scenario of 15 transmission towers with a concrete pad for a base for the length of the transmission line was used to calculate the area of permanent disturbance for Alternative B.

Calculated acres of natural habitats and agricultural lands represent the 2009 baseline conditions (i.e., Existing Conditions).

The terrestrial biological resources impact assessment relied on hydrologic and operational modeling performed using CALSIM II to provide a quantitative basis from which to assess the potential impacts of the alternatives on riparian and wetland habitat in portions of the Extended and Secondary study areas. Monthly river flows, and water surface elevations derived based on monthly river flows and end-of-month reservoir storages from CALSIM II, provided a quantitative basis to assess the potential impacts of operations on these habitat types, relative to the CEQA and NEPA bases of comparison, for the period of simulation extending from water year 1922 through 2003 (82-year simulation period). Detailed discussion of the CALSIM II model is provided in Appendix 6B.

Further, in assessing the impacts to the valley foothill riparian vegetation along the Sacramento River in the Secondary Study Area, modeling specific to riparian vegetation, including results from the SRH-1DV and SacEFT models, were used.

The SRH-1DV model simulated the establishment, growth, and mortality of vegetation, in addition to computing hydraulics and groundwater surface in the riparian zone near the river. The simulation tracked daily vegetation changes through 82 years of simulated flow, within the 107 river miles of Sacramento River from upstream of Red Bluff (RM 250) to upstream of Colusa (RM 143). SRH-1DV analysis focused on four key valley foothill riparian vegetation types: cottonwood, mixed forest, Gooding's black willow, and narrow leaf willow. The detailed description of the SRH-1DV model and the associated alternatives evaluation is provided in Appendix 8A.

The SacEFT is a decision support tool that linked flow management actions on the Sacramento River to changes in the physical habitats for several focal species of concern. It specifically includes performance measures for evaluating the effects of various flow scenarios on the initiation success and post-initiation scour risk of the Fremont Cottonwood seedlings, as well as on habitat potential/suitability and peak flow

during the nesting period for bank swallows. These performance measures were used as a general indicator for assessing the impacts on riparian vegetation and bank swallow colonies along the Sacramento River in the Secondary Study Area. The detailed description of the SacEFT model and the associated alternatives evaluation is provided in Appendix 8B.

14.3.4 Topics Eliminated from Further Analytical Consideration

Because no Project facilities would be constructed or maintained within the Extended Study Area, only operational impacts associated with Alternatives A, B, and C are discussed in the impacts analysis for the Extended Study Area for the three alternatives.

Because no construction or maintenance activities would occur within the Secondary Study (with the exception of the Red Bluff Pumping Plant), only operational impacts associated with Alternatives A, B, and C are discussed in the impacts analysis for the reservoirs and waterways included in the Secondary Study Area for the three alternatives.

Because the Primary Study Area Project facilities with an above-ground footprint would result in permanent wildlife habit loss during their construction, the impact of the operation and maintenance of those facilities on wildlife habitat (**Impact Wild-1**) is not discussed.

Similarly, when the permanent loss or conversion of a wildlife habitat type resulting from Project facility construction would make that location unsuitable for, or unable to support, specific special-status wildlife species, the impact of the operation and maintenance of that facility on the species (**Impact Wild-2**) is not discussed. Operation and maintenance impacts are discussed, however, for the bald eagle and golden eagle because those species would still be located in the Sites Reservoir and Dams area after Project construction is complete. Operation and maintenance impacts are not discussed for the remaining wildlife species because those species would lose their suitable habitat during Project construction, and would, therefore, no longer be present.

Operation and maintenance of the GCID Canal Facilities would resume following completion of the Project's construction activities associated with the proposed GCID Canal Facilities Modifications, and would have no Project-related impacts on wildlife or wildlife habitat. Therefore, operation and maintenance impacts associated with this facility are not discussed further.

For the proposed underground pipelines within the Primary Study Area, operations would occur underground and be coordinated remotely; therefore, the impacts of pipeline operation are not discussed.

Within the Project Buffer, no on-the-ground activities would occur during Project operation. Therefore, the impact of Project operation within the Project Buffer is not discussed.

14.3.5 Impacts Associated with the No Project/No Action Alternative

14.3.5.1 Extended Study Area – No Project/No Action Alternative

Construction, Operation, and Maintenance Impacts

Agricultural, Municipal, Industrial, and Wildlife Refuge Water Use

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

The No Project/No Action Alternative includes implementation of projects and programs being constructed, or those that have gained approval, as of June 2009. The impacts of these projects have already been evaluated on a project-by-project basis, pursuant to CEQA and/or NEPA, and their potential for impacts to wildlife habitat has been addressed in those environmental documents. Therefore, **there would not be a substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Population growth is expected to occur in California throughout the period of Project analysis (i.e., 100 years), and is included in the assumptions for the No Project/No Action Alternative. Urbanization that is planned according to General Plans could be expected to cause the conversion of natural wildlife habitats to urban uses. However, General Plans and any related construction activities would be subject to their own environmental reviews. Therefore, population growth associated with implementation of the No Project/No Action Alternative **would not have a substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Refer to the **Impact Wild-1** discussion. That discussion is also applicable to special-status wildlife species.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-1** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Refer to the **Impact Wild-1** discussion. That discussion is also applicable to the effects of human disturbance on common wildlife.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-1** discussion. That discussion is also applicable to conflicts with habitat plans.

San Luis Reservoir

Modeling results indicate that implementation of the No Project/No Action Alternative, when compared to Existing Conditions, would result in the same or slightly decreased water level elevations during most water years, and the same or slightly increased water level elevations during Dry and Critical years at San Luis Reservoir.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Negligible fluctuations in San Luis Reservoir surface water elevations that are expected with implementation of the No Project/No Action Alternative would not be expected to adversely affect the small amount of riparian or wetland habitat that exists around the reservoir because the habitat is located in seeps and is already subject to large water level fluctuations. Because the reservoir already experiences large water level fluctuations, the relative availability of open water (lacustrine) habitat would not be expected to change. Slight changes in surface water elevations at San Luis Reservoir resulting from implementation of the No Project/No Action Alternative would, therefore, **not have a substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because slight changes in surface water elevations at San Luis Reservoir would have a less-than-significant impact on lacustrine, riparian, and wetland habitat, the water level fluctuations would not be expected to have a substantial adverse effect on wildlife species associated with those habitat types. Therefore, slight changes in surface water elevations at San Luis Reservoir resulting from implementation of the No Project/No Action Alternative **would not have a substantial adverse effect** on special-status wildlife species, when compared to Existing Conditions.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

None of the projects included in the No Project/No Action Alternative are located at San Luis Reservoir. Therefore, there **would not be a substantial adverse effect**, when compared to Existing Conditions.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Anticipated water level fluctuations at San Luis Reservoir associated with implementation of the No Project/No Action Alternative would be within the historical range of operation, when compared to Existing Conditions, and consequently would not conflict with any HCPs, NCCPs, or local ordinances. Therefore, **there would not be a substantial adverse effect**, when compared to Existing Conditions.

14.3.5.2 Secondary Study Area – No Project/No Action Alternative

Construction, Operation, and Maintenance Impacts

Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in no change to surface water elevations at Trinity or Shasta lakes, and therefore, **would not have a substantial adverse effect** on the surrounding wildlife habitat. Modeling results indicate slight decreases in surface water elevations at Lake Oroville and Folsom Lake, but the small decreases would not be expected to affect the lacustrine or surrounding riparian or wetland habitats. Therefore, the impacts of small surface water elevation fluctuations on wildlife habitat at these two reservoirs resulting from implementation of the No Project/No Action Alternative **would not have a substantial adverse effect**, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in no change to surface water elevations at Trinity or Shasta lakes, and therefore, **would not have a substantial adverse effect** on special-status species. Because slight changes in surface water elevations at Lake Oroville and Folsom Lake would have a less-than-significant impact on lacustrine, riparian, or wetland habitats, the water level fluctuations would not be expected to have a substantial adverse effect on wildlife species associated with those habitat types. Slight changes in surface water elevations at these two reservoirs resulting from implementation of the No Project/No Action Alternative, therefore, **would not have a substantial adverse effect** on special-status wildlife species, when compared to Existing Conditions.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

The No Project/No Action Alternative includes implementation of projects and programs being constructed, or those that have gained approval, as of June 2009. The impacts of these projects have already been evaluated on a project-by-project basis, pursuant to CEQA and/or NEPA, and their potential for impacts to wildlife habitat has been addressed in those environmental documents. Therefore, **there would not be a substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-4** discussion. That discussion is also applicable to conflicts with habitat plans.

Lewiston Lake, Whiskeytown Lake, Keswick Reservoir, Lake Natoma, and the Thermalito Complex

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Modeling was not conducted for Lewiston Lake, Keswick Reservoir, Lake Natoma, or the Thermalito Complex. However, modeling conducted on the reservoirs upstream of these reservoirs indicates that the No Project/No Action Alternative, when compared to Existing Conditions, would result in either no change or slight changes to surface water level elevations. Because these reservoirs would continue to operate as regulating reservoirs, it is expected that there would be little or no change in surface water level elevations, and therefore, they **would not have a substantial adverse effect** on the lacustrine or surrounding riparian or wetland habitat. Modeling was conducted for Whiskeytown Lake for flows downstream of the lake, and flows would experience slight changes. Because the reservoir upstream of Whiskeytown would experience slight changes, and the flows released from Whiskeytown would experience slight changes, surface water elevations associated with implementation of the No Project/No Action Alternative would not be expected to fluctuate, and therefore, **would not have a substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because slight changes in surface water elevations at these four reservoirs and the Thermalito Complex would have a less-than-significant impact on lacustrine and the surrounding riparian or wetland habitat, the water level fluctuations would not be expected to have a substantial adverse effect on wildlife species associated with those habitat types. Slight changes in surface water elevations at these facilities resulting from implementation of the No Project/No Action Alternative, therefore, **would not have a substantial adverse effect** on special-status wildlife species, when compared to Existing Conditions.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake for the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake for the No Project/No Action Alternative. That discussion is also applicable to conflicts with habitat plans.

Trinity River

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Modeling results for Trinity River flows downstream of Lewiston Lake for the No Project/No Action Alternative, when compared to Existing Conditions, indicate slight changes in flows during Below Normal, Dry, or Critical water years. However, large decreases in flow are indicated during Wet water years during the months of March and April, and large increases in flows are indicated in Above Normal water years in the month of February. These changes in the flow regime have the potential to adversely affect riparian habitat. However, riparian habitat is adapted to flow variations. The expected decreases in spring flows during Wet water years and the expected increases in flow during late winter in Above Normal water years would, therefore, not be expected to substantially adversely affect riparian vegetation. These modifications of the flow regime of the Trinity River resulting from implementation of the No Project/No Action Alternative, therefore, **would not have a substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because changes to the Trinity River flow regime in Wet and Above Normal water years would have a less-than-significant impact on riparian habitat, the water level fluctuations would not be expected to have a substantial adverse effect on riparian-associated wildlife species. Changes in the Trinity River flow regime resulting from implementation of the No Project/No Action Alternative, therefore, **would not have a substantial adverse effect** on special-status terrestrial wildlife species, when compared to Existing Conditions.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake. That discussion is also applicable to conflicts with habitat plans.

Klamath River downstream of the Trinity River

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Modeling results for the Klamath River downstream of the Trinity River for the No Project/No Action Alternative, when compared to Existing Conditions, indicate negligible changes in flows. These negligible changes in the flow regime would not be expected to adversely affect riparian vegetation. Implementation of the No Project/No Action Alternative, therefore, **would not have a substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because changes to the Klamath River downstream of the Trinity River would be negligible and would not adversely affect riparian vegetation, they would also not be expected to have an adverse effect on riparian-associated wildlife species. Implementation of the No Project/No Action Alternative, therefore, **would not have a substantial adverse effect** on special-status wildlife species, when compared to Existing Conditions.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake. That discussion is also applicable to conflicts with habitat plans.

Spring Creek

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Operational modeling was not performed for Spring Creek. However, with implementation of the No Project/No Action Alternative, operations of Whiskeytown Lake and Keswick Reservoir are expected to result in small changes, and therefore, would not be expected to affect the released flows that dilute Spring Creek runoff. Because no change in the dilution of Spring Creek runoff is expected with implementation of the No Project/No Action Alternative, **there would not be a substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Refer to the **Impact Wild-1** discussion. That discussion is also applicable to special-status wildlife species.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-1** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake. That discussion is also applicable to conflicts with habitat plans.

Sacramento River

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in negligible changes to the flow regime of the Sacramento River, with the exception of decreased flows downstream of Keswick in November during Dry years. Large changes in the flow regime have the potential to adversely affect riparian habitat. However, riparian habitat is adapted to flow variations, and changes in flow during one month in Dry years would not be expected to substantially adversely affect riparian vegetation. Therefore, the modifications to the flow regime of the Sacramento River resulting from implementation of the No Project/No Action Alternative **would not have a substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because changes to the Sacramento River flow regime in November during Dry years would have a less-than-significant impact on riparian habitat, the flow regime changes would not be expected to have a substantial adverse effect on riparian-associated wildlife species. Changes in the Sacramento River flow regime resulting from implementation of the No Project/No Action Alternative, therefore, **would not have a substantial adverse effect** on special-status wildlife species, when compared to Existing Conditions.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake. That discussion is also applicable to conflicts with habitat plans.

Clear Creek

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in small changes to the flow regime of Clear Creek, with the exception of large increases in flows during Critical years. These changes in the flow regime have the potential to adversely affect riparian habitat. However, an increase in flow during Critical years could reduce or prevent the desiccation of riparian vegetation. Therefore, changes to the flow regime of Clear Creek resulting from implementation of the No Project/No Action Alternative would have a **potentially beneficial effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because changes to the Clear Creek flow regime during Critical years would have a potentially beneficial impact on riparian habitat, the flow regime changes would not be expected to have an adverse effect on riparian-associated wildlife species. Changes in the Clear Creek flow regime resulting from

implementation of the No Project/No Action Alternative, therefore, **would not have a substantial adverse effect** on special-status wildlife species, when compared to Existing Conditions.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake. That discussion is also applicable to conflicts with habitat plans.

Feather River

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in numerous large changes to the flow regime of the Feather River. These changes in the flow regime have the potential to adversely affect riparian habitat. The changes to the flow regime that are most likely to affect riparian habitat include greatly increased flows ranging from June through September in all but Dry water year types, with the exception of decreases in July in Critical years. The increased flows have the potential to inundate riparian vegetation. Adverse effects could also result from large decreases in flows during late August in Dry years, which could desiccate riparian vegetation. The modifications of the existing flow regime of the Feather River resulting from implementation of the No Project/No Action Alternative could substantially adversely affect riparian vegetation, and therefore, **would have a potentially substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because changes to the Feather River flow regime would have a potentially significant impact on riparian habitat, the flow regime changes would also potentially have a substantial adverse effect on riparian-associated wildlife species. The increased June through September flows that could adversely affect riparian habitat could also inundate bank swallow burrows during the breeding season. Changes in the Feather River flow regime resulting from implementation of the No Project/No Action Alternative, therefore, **would have a potentially substantial adverse effect** on special-status wildlife species, when compared to Existing Conditions.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake. That discussion is also applicable to conflicts with habitat plans.

Sutter Bypass

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in small changes in spills into Moulton, Tisdale, and Ord Ferry weirs. Colusa Weir would experience a decrease in spills during November, especially in Dry years. Changes to the flow regime of the Sutter Bypass have the potential to adversely affect riparian habitat. However, three of the four weirs that spill into the Bypass are not expected to experience large changes in flows, and Colusa weir would only experience large decreases in flood flows during November. The riparian habitat within the Sutter Bypass has adapted to flow variations, and changes in flow from one weir during one month would not be expected to substantially adversely affect the riparian vegetation. Therefore, the modifications of the existing flow regime of the Sutter Bypass resulting from implementation of the No Project/No Action Alternative **would not have a substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because changes in spills into the Sutter Bypass would have a less-than-significant impact on riparian habitat, the changes to the flow regime would not be expected to have a substantial adverse effect on riparian-associated wildlife species. Changes in the Sutter Bypass flow regime resulting from implementation of the No Project/No Action Alternative, therefore, **would not have a substantial adverse effect** on special-status wildlife species, when compared to Existing Conditions.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake. That discussion is also applicable to conflicts with habitat plans.

Yolo Bypass

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in small changes in monthly flows into the Yolo Bypass, with the exception of large decreases in flow during late fall in Below Normal and Dry years. Changes to the flow regime of the Yolo Bypass have the potential to adversely affect riparian habitat. However, riparian habitat is adapted to flow variations, and decreases in flood flows during late fall in Below Normal and Dry years would not be expected to substantially adversely affect riparian vegetation. Therefore, the modifications to the flow regime of the Yolo Bypass resulting from implementation of the No Project/No Action Alternative **would not have a substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because changes in spills into the Yolo Bypass would have a less-than-significant impact on riparian habitat, the changes to the flow regime would not be expected to have a substantial adverse effect on riparian-associated wildlife species. Changes in the Yolo Bypass flow regime resulting from implementation of the No Project/No Action Alternative, therefore, **would not have a substantial adverse effect** on special-status terrestrial wildlife species, when compared to Existing Conditions.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake. That discussion is also applicable to conflicts with habitat plans.

American River

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in decreases in flows on the American River in all months. Large decreases in flow are also indicated in September of Above Normal years, September and October of Below Normal years, and in July and August in Critical years. This reduction in flows, coupled with the substantial reductions in flows during early fall in Below Normal and Dry water year types, has the potential to adversely affect riparian habitat by desiccating established vegetation and reducing recruitment. The modifications to the existing flow regime of the American River resulting from implementation of the No Project/No Action Alternative, therefore, **would have a potentially substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because changes to the American River flow regime would have a potentially significant impact on riparian habitat, the flow regime changes could also have a substantial adverse effect on riparian-associated wildlife species. Changes in the American River flow regime resulting from implementation of the No Project/No Action Alternative, therefore, **would have a potentially substantial adverse effect** on special-status wildlife species, when compared to Existing Conditions.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake. That discussion is also applicable to conflicts with habitat plans.

Sacramento-San Joaquin Delta

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in negligible changes in Sacramento-San Joaquin Delta monthly outflow. This lack of change to Sacramento-San Joaquin Delta outflow resulting from implementation of the No Project/No Action Alternative **would not have a substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Refer to the **Impact Wild-1** discussion. That discussion is also applicable to special-status wildlife species.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-1** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake. That discussion is also applicable to conflicts with habitat plans.

Suisun Bay, San Pablo Bay, and San Francisco Bay

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Modeling results indicate that the No Project/No Action Alternative, when compared to Existing Conditions, would result in an overall negligible change in the position of X2, as well as an overall negligible change in Delta monthly outflow. Therefore, Suisun, San Pablo, and San Francisco bays would

also be expected to experience negligible changes. Negligible changes in the flow regime of these bays resulting from implementation of the No Project/No Action Alternative, therefore, **would not have a substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because changes in the flow regime of the bays would have a less-than-significant impact on riparian and wetland habitat types, the changes to the flow regime would not be expected to have a substantial adverse effect on riparian- or wetland-associated wildlife species. Changes in the flow regime of the three bays resulting from implementation of the No Project/No Action Alternative, therefore, **would not have a substantial adverse effect** on special-status terrestrial wildlife species, when compared to Existing Conditions.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-4** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake. That discussion is also applicable to conflicts with habitat plans.

14.3.5.3 Primary Study Area – No Project/No Action Alternative

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

With implementation of the No Project/No Action Alternative, the Project would not be built and there would, therefore, be no construction, operation, or maintenance impacts within the Primary Study Area. Additionally, none of the 14 projects included in the No Project/No Action Alternative are located within the Primary Study Area. Despite expected growth within Glenn and Colusa counties throughout the period of Project analysis (i.e., 100 years), no large-scale construction or growth is anticipated in the Primary Study Area. Funks Reservoir would be expected to continue to operate at current levels as a regulating reservoir. Landowners would continue to graze cattle, harvest crops, modify land uses based on the value of crops, and harvest fuel wood at levels similar to current practices. These continued activities would not be expected to decrease current habitat quantity, but could affect habitat quality.

Continued cattle grazing in areas that have unrestricted access to creeks would continue to degrade the quality of riparian habitat. The removal of blue oaks reduces habitat quality by reducing canopy cover and

tree density. Continued fuel wood harvest, at the rate that has been observed since 2000, would eliminate large areas of blue oak woodland habitat because tree removal eventually converts the woodlands to annual grassland habitat. Therefore, the continued land use activities within the Primary Study Area that would continue to occur with implementation of the No Project/No Action Alternative **would have a potentially substantial adverse effect** on wildlife habitat, when compared to Existing Conditions.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because continued land use practices would have a potentially significant impact on riparian and blue oak woodland habitat, the habitat modifications could also have a substantial adverse effect on riparian- and blue oak woodland-associated wildlife species. However, no State- or federally-listed wildlife species were documented within the Primary Study Area that are associated with, or dependent upon, these wildlife habitats. Therefore, the continued land use activities within the Primary Study Area that would continue to occur with implementation of the No Project/No Action Alternative **would not have a substantial adverse effect** on special-status wildlife species, when compared to Existing Conditions.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

None of the projects included in the No Project/No Action Alternative would occur within the Primary Study Area. Therefore, **there would not be a substantial adverse effect** on terrestrial wildlife from human disturbance associated with construction, operation, or maintenance-related activities, when compared to Existing Conditions.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

There are no HCPs or NCCPs that address the Primary Study Area. Additionally, none of the projects included in the No Project/No Action Alternative would occur within the Primary Study Area. Therefore, **there would not be a substantial adverse effect**, when compared to Existing Conditions.

14.3.6 Impacts Associated with Alternative A

14.3.6.1 Extended Study Area – Alternative A

Construction, Operation, and Maintenance Impacts

Agricultural Water Use

Operational modeling indicates that implementation of Alternative A would result in increased water supply reliability in all years for agricultural water users, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Increased agricultural water supply reliability has the potential to increase the amount of land in agricultural production, which could result in the conversion of natural wildlife habitats. The increased water supply reliability also has the potential to cause changes in cropping patterns, such as from annual crops to orchards. The surface water could also be used to replace existing groundwater use, which would have no effect on wildlife habitats. The actual effect would vary by region depending on water availability and associated costs. However, modeling results show that the potential effects of increased water supply reliability would be small, and would not occur on a large enough scale to have a substantial adverse effect on wildlife habitats. Therefore, the increase in water supply reliability to agricultural water users associated with implementation of Alternative A would have a **less-than-significant impact** on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because increased agricultural water supply reliability has the potential to result in the conversion of natural wildlife habitats and to change cropping patterns, the increased reliability could result in decreased habitat suitability for wildlife species. However, modeling results show that the potential effects of increased water supply reliability would be small, and they would, therefore, not be expected to have a substantial adverse effect on wildlife. Therefore, the increase in water supply reliability to agricultural water users associated with implementation of Alternative A would have a **less-than-significant impact** on special-status terrestrial wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with the increased water supply reliability resulting from implementation of Alternative A. Therefore, there would be **no impact** to wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Modeling results show that the potential effects of increased water supply reliability to agricultural water users would be small, and they would, therefore, not be expected to have a substantial adverse effect on wildlife or wildlife habitat. Therefore, increased water supply reliability associated with implementation of Alternative A would not conflict with any HCPs, NCCPs, or local ordinances, and would result in **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Municipal and Industrial Water Use

Operational modeling indicates that implementation of Alternative A would result in increased water supply reliability to municipal and industrial water users in Dry years, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Increased water supply reliability has the potential to accommodate population growth, which could result in the conversion of natural wildlife habitats to urban/disturbed habitat. However, water supply reliability would not be increased in all water year types, and the increased reliability during Dry years would not be expected to accommodate population growth. Therefore, increased water supply reliability for municipal and industrial water users during Dry years resulting from implementation of Alternative A would result in a **less-than-significant** impact to wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because increased water supply reliability for municipal and industrial use would not be expected to adversely affect wildlife habitat, it would not be expected to affect wildlife species. Therefore, increased municipal and industrial water supply reliability resulting from implementation of Alternative A would have a **less-than-significant impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with the increased water supply reliability resulting from implementation of Alternative A. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Because increased water supply reliability for municipal and industrial use would not be expected to adversely affect wildlife or wildlife habitat, it would not conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, result in **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Wildlife Refuge Water Use

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Level 4 water supply would benefit numerous wildlife species that use fresh emergent wetland habitat. Implementation of Alternative A would provide an alternate source of wildlife refuge water in some years, but would not increase its reliability. Therefore, the provision of an alternate source of wildlife refuge water supply would have **no impact** on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because the provision of an alternate source of wildlife refuge water supply would have no impact on wildlife habitat, it would also be expected to have **no impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with the provision of an alternate source of wildlife refuge water supply. Therefore, there would be **no impact** to wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Because the provision of an alternate source of wildlife refuge water supply would not affect wildlife or wildlife habitat, it would not conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, result in **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

San Luis Reservoir

San Luis Reservoir experiences severe water level fluctuations. Operational modeling indicates that implementation of Alternative A would result in continued water level fluctuations at San Luis Reservoir, but the fluctuations would occur more often and could be more severe, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Severe water level fluctuations could adversely affect the wetland and riparian scrub vegetation that exists within the tributary drainages in the San Luis Reservoir drawdown zone. However, these patches of wetland and riparian vegetation are located in areas that have their own hydrology, and have historically been subjected to severe drawdowns. These habitat types would not be expected to be substantially adversely affected by continued fluctuations at an increased rate. Therefore, the increased fluctuations in water levels at San Luis Reservoir resulting from implementation of Alternative A would have a **less-than-significant impact** on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Severe water level fluctuations could affect the quality of wetland and riparian scrub vegetation that exists within the tributary drainages in the San Luis Reservoir drawdown zone. Fluctuations could also reduce habitat suitability for wildlife that rely on the reservoir as a drinking water source because they could have a longer distance to travel from the cover of vegetation to the water's edge. Small mammals, reptiles, and amphibians would have an increased risk of predation as the distance from the annual grassland or blue oak woodland habitat to the water's edge increases. However, alternate water sources exist in the streams, creeks, springs, and seeps surrounding the reservoir.

Severe water level fluctuations could also result in a reduction of the open water portion of the lacustrine habitat that may be used by avian species of special concern. However, these avian species, as well as the riparian-associated small mammals, reptiles, and amphibians, have historically been subjected to severe drawdowns at the reservoir and have adapted to those conditions. These species would not be expected to be substantially adversely affected by continued fluctuations at an increased rate. Therefore, the increased fluctuations in water levels at San Luis Reservoir resulting from implementation of Alternative A would have a **less-than-significant impact** on special-status terrestrial wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with the operational changes at San Luis Reservoir resulting from implementation of Alternative A. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Anticipated water level fluctuations at San Luis Reservoir resulting from implementation of Alternative A would be within the historical range of operation, and consequently, would not conflict with any HCPs, NCCPs, or local ordinances. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

14.3.6.2 Secondary Study Area – Alternative A

Construction, Operation, and Maintenance Impacts

Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake

Operational modeling indicates that implementation of Alternative A would provide operational flexibility to Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake, when compared to Existing Conditions and the No Project/No Action Alternative. Storage at these reservoirs would be improved in all months of all years, including during May through October in Dry and Critical year conditions. In other years, larger releases would be made to stabilize fall flow conditions. Seasonal and monthly improvements in storage would occur, when compared to Existing Conditions and the No Project/No Action Alternative. In addition to improved storage conditions, operational modeling indicates that these reservoirs would experience a reduced range of change in fluctuations, resulting in less severe drawdowns.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Frequent and severe drawdowns tend to favor the establishment of upland plant communities along the shoreline, rather than riparian vegetation. A reduction in the reservoir level fluctuations has the potential to allow the establishment of riparian habitat in these shoreline areas. Therefore, changes in operations at Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake associated with implementation of Alternative A that would result in improved storage conditions and reduced water level fluctuations would have a **beneficial effect** on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The lacustrine habitat of these reservoirs supports numerous species of terrestrial wildlife, including the special-status bald eagle. Nesting bald eagles have been documented along the edge of each of these reservoirs. Bald eagle productivity would decrease as water surface elevation would decrease, so changes in reservoir surface water elevation fluctuations have the potential to adversely affect this species. However, the improved storage and reduced reservoir level fluctuations at these reservoirs would increase habitat suitability for bald eagles. These operational improvements would also be beneficial to the lacustrine wildlife species that use open water habitat, as well as wildlife that depend on the reservoirs as a source of drinking water. Therefore, changes in operations at Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake associated with implementation of Alternative A that would result in improved storage

conditions and reduced water level fluctuations would have a **beneficial effect** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion for Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with improved storage conditions at these reservoirs. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Anticipated changes to the flow regime or storage conditions of Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake resulting from implementation of Alternative A would be within the historical range of operation, and would not adversely affect wildlife or wildlife habitat. Consequently, these changes would not conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, result in **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Lewiston Lake, Whiskeytown Lake, Keswick Reservoir, Lake Natoma, and the Thermalito Complex

Whiskeytown Lake is expected to operate as it has historically as a regulating reservoir for flow coming through the Clear Creek Tunnel. Lewiston Lake, Keswick Reservoir, Lake Natoma, and the Thermalito Complex (which includes the Thermalito Diversion Pool, Thermalito Forebay, and Thermalito Afterbay) are also expected to continue to operate, as they have historically, as regulating reservoirs for upstream reservoirs.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Changes in reservoir surface water elevation fluctuations have the potential to adversely affect surrounding wildlife habitats. However, because no change in operation is expected at any of these reservoirs as a result of implementation of Alternative A, the lacustrine and surrounding habitat types would not be affected. Therefore, there would be **no impact** to wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The lacustrine habitat of these reservoirs supports numerous species of terrestrial wildlife, including the special-status bald eagle. Nesting bald eagles have been documented along the edge of Lewiston Lake,

Whiskeytown Lake, and the Thermalito Diversion Pool. Suitable giant garter snake habitat exists within portions of the Thermalito Forebay and Afterbay and in immediately adjacent areas. The Thermalito Afterbay also supports a mixed Clark's and western grebe nesting colony. Changes in reservoir surface water elevation fluctuations have the potential to adversely affect these species. However, because no change in operation is expected at any of these reservoirs as a result of implementation of Alternative A, and the habitat types that these species are associated with are not expected to be affected, there would be **no impact** to special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. Changes in reservoir surface water elevation fluctuations have the potential to adversely affect the Clark's and western grebe nesting colony. However, because no change in operation is expected at the Thermalito Afterbay as a result of implementation of Alternative A, there would be **no impact** to these nesting colonies, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with the operation of these reservoirs. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Because no change in operation is expected at any of these reservoirs as a result of implementation of Alternative A, there would be no conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, result in **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Trinity River

Operational modeling indicates that Trinity River flows would meet or exceed the Trinity River Record of Decision (ROD) requirements with implementation of Alternative A. Project operations could change the timing of flows through the Clear Creek Tunnel, but not the amount supplied. Modeling results show little change from the existing flow schedule, and the small amount of change would rarely occur.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Modifications to the existing flow regime could have an adverse effect on the montane and valley foothill riparian habitats along the Trinity River. However, because the ROD requirements would be met or exceeded, and implementation of Alternative A would result in occasional small changes to the existing flow schedule, these habitat types would not be expected to be substantially adversely affected. Therefore, changes to the flow regime of the Trinity River resulting from implementation of Alternative A would

have a **less-than-significant impact** on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The montane and valley foothill riparian habitats along the Trinity River support numerous wildlife species, including the special-status bald eagle, osprey, and willow flycatcher. The nearshore portion of the riverine habitat also supports numerous wildlife species, including the special-status foothill yellow-legged frog. Modifications of the existing flow regime could have an adverse effect on these habitat types and their associated wildlife species. However, because the ROD requirements would be met or exceeded, and implementation of Alternative A would result in occasional small changes to the existing flow schedule, these habitat types would not be expected to be substantially adversely affected. Therefore, changes to the Trinity River flow regime resulting from implementation of Alternative A would have a **less-than-significant impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with changes in Trinity River flows resulting from implementation of Alternative A. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Anticipated changes to the flow regime of the Trinity River resulting from implementation of Alternative A would be within the historical range of operation and would not adversely affect wildlife or wildlife habitat. Consequently, these changes would not conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, result in **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Klamath River downstream of the Trinity River

Operational modeling indicates that implementation of Alternative A would not affect the Klamath River flow regime.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Montane and valley foothill riparian habitats are located along the lower Klamath River. Modifications of the existing flow regime could have an adverse effect on these habitat types. However, implementation of Alternative A would not change the existing flow regime of the Klamath River. Therefore, there would be **no impact** to wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The montane and valley foothill riparian habitats along the lower Klamath River support numerous wildlife species, including the special-status bald eagle and osprey. The nearshore portion of the riverine habitat also supports numerous wildlife species. Modifications of the existing flow regime could have an adverse effect on these wildlife species. However, implementation of Alternative A would not change the existing flow regime of the Klamath River. Therefore, there would be **no impact** to special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Implementation of Alternative A would not change the existing flow regime of the lower Klamath River. Therefore, there would be **no impact** to native resident or migratory wildlife species, or to wildlife nursery sites, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with operational effects to the Klamath River resulting from implementation of Alternative A. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Because the flow regime of the Klamath River is not expected to be affected by implementation of Alternative A, wildlife or wildlife habitat would not be adversely affected. Consequently, there would be no conflict with any HCPs, NCCPs, or local ordinances, and would result in **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Spring Creek

Operational modeling was not performed for Spring Creek. Spring Creek runoff is diluted by flows from Whiskeytown Lake through the Spring Creek Tunnel before it enters the Sacramento River. Those flows are diluted again by releases from Keswick Reservoir once they enter the Sacramento River.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Implementation of Alternative A would not change operation of Whiskeytown Lake or Keswick Reservoir, and therefore, would not be expected to affect the released flows that dilute Spring Creek runoff. Because no change in the dilution of Spring Creek runoff is expected as a result of implementation of Alternative A, there would be **no impact** on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because implementation of Alternative A would have no impact on Spring Creek wildlife habitat, it would not be expected to adversely affect the wildlife species associated with that habitat. Therefore, implementation of Alternative would have **no impact** on special-status wildlife species on Spring Creek, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with Spring Creek dilution flows. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Because no change in operation is expected at Spring Creek as a result of implementation of Alternative A, there would be no conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, result in **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Sacramento River

Operational modeling indicates that Sacramento River flows would meet or exceed the OCAP Biological Opinion requirements with or without the Project. When compared to Existing Conditions and the No Project/No Action Alternative, Alternative A operations would result in changes to the flow regime upstream of the location of Project diversions as a result Project-related operational changes at Shasta Lake. Systematic changes in flows downstream of each of the Project diversions would occur as a result of the combination of Shasta Lake operational changes and the diversion of up to 5,900 cfs at the Project intakes when diversions occur.

Modeling results indicate that there would be no change in the frequency or severity of flood events, and consequently no large change in the movement of sediment or timing of scour events, because the modeling inputs purposely avoided effects to the Sacramento River from regulation and diversion when the flow is between 15,000 and 25,000 cfs. For the Sacramento River upstream of the Project diversions, implementation of Alternative A would result in stage fluctuations of approximately -0.6 to 0.5 feet using the Bend Bridge location as the indicator, when compared to Existing Conditions and the No Project/No Action Alternative. September flows would vary in the amount of increases. Downstream of Project diversions, July and August flow changes would be negligible. Using Wilkins Slough as an indicator for this reach, there would be changes in the stage of approximately -2.3 to 2.8 feet if Alternative A is implemented, when compared to Existing Conditions and the No Project/No Action Alternative. The reduction in stage would mainly occur in the winter and spring months, when the water would be diverted from the Sacramento River to Sites Reservoir; higher stage values would occur in the summer and fall months because of the releases from the Sites Reservoir to the river. Fall flows from Shasta Lake to Project intakes would decrease, but Project releases would stabilize fall flows downstream of the intakes, especially in Dry years.

Modeling performed using SRH-IDV and SacEFT indicates that the coverage of the valley foothill riparian vegetation alliance along the Sacramento River would increase or would remain similar with implementation of Alternative A relative to Existing Conditions and the No Project/No Action Alternative. For bank swallows, SacEFT modeling indicates negligible effects resulting from peak flow during nesting season and a slight decrease in habitat potential and suitability with implementation of Alternative A, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Valley foothill riparian and backwater habitats are located along the Sacramento River. Modifications to the existing flow regime could alter the formation of off-channel habitats. New off-channel habitat is created during large fall and winter flow events, and existing off-channel backwater areas can fill in with sediment and vegetation if these flow events do not occur. However, modeling results indicate that the timing and magnitude of flood events, and consequently the conditions required for creating and maintaining these backwater habitats, would not be expected to change with implementation of Alternative A. Modifications to the existing flow regime could also affect the establishment of riparian habitat, or reduce the survival rate of early successional stages of riparian habitat that already exist. Elderberry shrubs are associated with riparian habitat, but are typically located higher up the slope of the bank rather than at the water's edge. An increase in river stage has the potential to cause inundation of some shrubs. However, the shrubs likely to be affected are already subjected to seasonal inundation, and the minor increase in river stage during the winter months would be within the historical range of conditions. Operational modeling for Alternative A, including modeling that is specific to riparian habitat, indicates a minimal effect to riparian habitat resulting from the described changes in the flow regime. Therefore, elderberry shrubs are not likely to be adversely affected. Similarly, riparian habitat in general would not be expected to be adversely affected.

It should be noted that although modeling results indicate that there would be only slight changes to backwater or riparian habitat when compared to Existing Conditions or the No Project/No Action Alternative, Existing Conditions is not necessarily good for these species. Implementation of Alternative A is not expected to make these conditions worse, but also is not expected to improve them. Therefore,

the impact of modifications of the existing flow regime of the Sacramento River resulting from implementation of Alternative A would have a **less-than-significant impact** on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The Sacramento River's backwater habitats support the western pond turtle, and are included in a recovery unit for the giant garter snake. The river's riparian habitat, which includes elderberry shrubs essential to the survival of the valley elderberry longhorn beetle, is known to support osprey, ringtail, and nesting bald eagles and western yellow-billed cuckoos. The largest known breeding population of bank swallows in California nests along the river. Riparian habitat along the Sacramento River may also support Swainson's hawks, long-eared owls, several special-status bat and songbird species, as well as willow flycatchers during migration. Modifications to the existing flow regime of the Sacramento River could have substantial adverse effects on these species.

Modifications to the existing flow regime could alter the formation of off-channel habitats, which could affect the western pond turtle and giant garter snake. However, modeling results indicate that the timing and magnitude of flood events, and consequently the conditions required for creating and maintaining these backwater habitats, would not be expected to change with implementation of Alternative A. Western pond turtles could also be affected by a rise in river stage during the breeding season, which could inundate eggs. Modeling results show, at most, a 4 to 6 inch increase in river stage during June, and minimal change in July or August. Because western pond turtles typically build nests away from the water's edge, an increase of 4 to 6 inches would not be expected to have a substantially adverse effect on this species.

Modifications to the existing flow regime could also affect the establishment of riparian habitat, or reduce the survival rate of early successional stages of riparian habitat that already exist, which in turn could adversely affect riparian-associated species. However, modeling that is specific to riparian habitat indicates a minimal effect to riparian habitat resulting from the described changes in the flow regime associated with implementation of Alternative A. Therefore, the special-status birds and mammals associated with riparian habitat would not be expected to be adversely affected.

Changes in the existing flow regime could result in changes to the frequency of the high flows required to cause sloughing of river banks, which are used by bank swallows, or could result in higher spring flows that have the potential to inundate nesting bank swallows. Modeling results indicate that there would be no change in the frequency or severity of flood events, and up to a 2 to 4 inch increase in river stage with implementation of Alternative A. Therefore, minimal effects to bank swallow habitat are expected. River stage in June would be increased 4 to 6 inches; this stage increase would be unlikely to inundate bank swallow nests, as the lowest nests are typically located a greater distance from the water level. There would not be an increase in high flows that could cause nest failure. SacEFT modeling specific to the bank swallow indicates that there would be minimal effects to this species.

It should be noted that, although modeling results indicate that there would be only minimal change to backwater habitat and its associated wildlife species, to riparian habitat and its associated wildlife species, or to bank swallows and their habitat requirements associated with Alternative A, when compared to Existing Conditions or the No Project/No Action Alternative, Existing Conditions are not necessarily

good for these species. Implementation of Alternative A is not expected to make these conditions worse, but also is not expected to improve them. Therefore, the impact of modifications of the existing flow regime of the Sacramento River resulting from implementation of Alternative A would have a **less-than-significant impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with changes to the Sacramento River flow regime. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Anticipated changes to the flow regime of the Sacramento River resulting from implementation of Alternative A would be within the historical range of operation and would not adversely affect wildlife or wildlife habitat. Consequently, these changes would not conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, have **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Pump Installation at the Red Bluff Pumping Plant

The installation of the pump would occur within an existing bay at the existing Red Bluff Pumping Plant. The construction activities associated with installing a pump at the existing pumping plant, which would require the use of a crane, are expected to occur along existing construction or access roads. Dewatering of the afterbay would likely be required, and would occur during regularly scheduled maintenance periods or during the non-irrigation season.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Installation of the pump at the existing pumping plant is not expected to involve any ground-disturbing activity, and therefore, would not result in a loss or alteration in habitat suitability. There would, therefore, be **no impact** to wildlife habitat associated with construction activities at the Red Bluff Pumping Plant, when compared to Existing Conditions and the No Project/No Action Alternative.

Operation of the additional pump could increase the rate of diversion from the Sacramento River by up to 250 cfs. This small increase would not be expected to adversely affect wildlife habitat downstream of the diversion. Therefore, the modification of the existing flow regime resulting from the operation of an additional pump at the Red Bluff Pumping Plant with implementation of Alternative A would have a

less-than-significant impact on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Operation of the additional pump could increase the amount of sediment that requires removal. However, sediment removal would occur during the regularly scheduled maintenance period for the canal and would involve the same maintenance activities conducted for Existing Conditions. Maintenance associated with the installation of a pump into an existing pumping plant would, therefore, have a **less-than-significant impact** on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Because pump installation, operation, and maintenance at the Red Bluff Pumping Plant would not be expected to adversely affect wildlife habitat, it would also not be expected to affect the special-status wildlife species associated with those habitat types. Therefore, installation of a pump at the Red Bluff Pumping Plant would have a **less-than-significant impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Wildlife may be directly or indirectly affected by the installation, operation, and maintenance of the additional pump. Construction activities, as well as maintenance activities associated with sediment removal, would include the use of heavy equipment, which could lead to increased disturbance to wildlife from noise. Pump operation could result in increased noise levels that may adversely affect wildlife. However, the addition of one pump would not be expected to impact wildlife above the existing level of disturbance already present from operation and maintenance of the other pumps in the pumping plant bay. Therefore, the human disturbance associated with installation and maintenance of this pump would be expected to have a **less-than-significant impact** on wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

The installation of an additional pump into an existing pumping plant bay that already has several pumps in it, associated with implementation of Alternative A, would not adversely affect wildlife or wildlife habitat, and consequently would not conflict with any HCPs, NCCPs, or local ordinances. There would, therefore, be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Clear Creek

Operational modeling indicates that Clear Creek flow requirements would be met or exceeded in all scenarios. With implementation of Alternative A, Clear Creek would have cooler temperatures resulting from the cooler temperatures in Whiskeytown Lake in Dry and Critical years.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Valley foothill riparian habitat is located along Lower Clear Creek. Modifications to the Clear Creek flow regime could have adverse effects on this habitat type. However, implementation of Alternative A would not change the existing flow regime of Clear Creek, and therefore, would have **no impact** on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The valley foothill riparian habitat along Lower Clear Creek supports numerous terrestrial wildlife species, including the foothill yellow-legged frog. Bank swallows and willow flycatchers have been observed foraging over the riverine and adjacent habitats, and some bank swallow nesting has been documented. Modifications to the flow regime of Clear Creek could have adverse effects on these species. However, Implementation of Alternative A would not change the existing Clear Creek flow regime, and therefore, would have **no impact** to special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with changes to the flow regime of Clear Creek. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Implementation of Alternative A would not affect the Clear Creek flow regime and would not adversely affect wildlife or wildlife habitat. Consequently, these changes would not conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, have **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Feather River

Operational modeling indicates that Feather River flows would meet or exceed the FERC Settlement Agreement's minimum flow requirements in all scenarios. The operational flexibility provided by implementation of Alternative A would result in a Feather River flow regime that would be less reactive to Delta conditions during summer and fall months. Consequently, when compared to Existing Conditions and the No Project/Action Alternative, flows in June through September in drier years would be improved. However, flows would generally be decreased during October, November, and December.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Valley foothill riparian and backwater habitats exist along the Feather River. Modifications to the existing flow regime have the potential to adversely affect these habitat types. However, implementation of Alternative A would allow the river to return to a flow regime that is more stable during summer and fall months. The higher flows that are released during summer months in Existing Conditions to improve Delta conditions have the potential to scour or inundate riparian habitat. Lower and more stabilized flows would reduce these risks. The lower summer flows associated with implementation of Alternative A would not be likely to have a substantial adverse effect on established riparian habitat, and could be beneficial in drier years when flows would be higher than Existing Conditions or the No Project/No Action Alternative. The reduced summer flows would also not be likely to adversely affect the hydrology of backwater habitats. Because the modification of the existing flow regime of the Feather River resulting from implementation of Alternative A would not be expected to adversely affect riparian habitat, and would not be expected to reduce the habitat suitability of the riverine or backwater habitats, this change would have a **less-than-significant impact** on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The riverine and valley foothill riparian habitats of the Feather River support numerous species of terrestrial wildlife, including special-status species. Giant garter snakes exist in isolated backwater habitats, and the river is included in a portion of an identified recovery unit for this species. Bald eagles, Swainson's hawks, and bank swallows have been documented nesting along this river, and the western yellow-billed cuckoo has historically bred on the lower river. The riparian habitat also supports the State fully-protected ringtail and western pond turtles. Modifications to the existing flow regime have the potential to adversely affect these species. However, implementation of Alternative A would return the river to a flow regime that is more stable during summer and fall months. The higher flows that are released during summer months in Existing Conditions to improve Delta conditions have the potential to scour or inundate riparian habitat, as well as inundate portions of bank swallow colonies. Lower and more stabilized flows would reduce these risks. The lower summer flows associated with implementation of Alternative A would not be likely to have a substantial adverse effect on established riparian habitat; consequently, riparian-associated species would not be expected to be adversely affected. The reduced summer flows would also not be likely to adversely affect the hydrology of backwater habitats used by the giant garter snake, and the resulting reduction in the velocity and temperature of the river flows could be beneficial to this species. Because the modification of the existing flow regime of the Feather River

resulting from implementation of Alternative A would not be expected to adversely affect riparian habitat or riparian-associated species, and would not be expected to reduce the habitat suitability of the riverine or backwater habitats, this change would have a **less-than-significant impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

The valley foothill riparian habitat of the Feather River supports at least two large mixed heron/egret rookeries. Modifications to the existing flow regime have the potential to adversely affect these rookeries. However, the lower summer flows associated with implementation of Alternative A would not be likely to have a substantial adverse effect on established riparian habitat, and could be beneficial in drier years when flows would be higher than Existing Conditions or the No Project/No Action Alternative. Consequently, these riparian-associated species would not be expected to be adversely affected. Because the modification of the existing flow regime of the Feather River resulting from implementation of Alternative A would not be expected to adversely affect riparian habitat or riparian-associated species, this change would have a **less-than-significant impact** on the mixed heron/egret rookeries, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated modification of the flow regime of the Feather River. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Anticipated changes to the flow regime of the Feather River resulting from implementation of Alternative A would be within the historical range of operation and would not adversely affect wildlife or wildlife habitat. Consequently, these changes would not conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, have **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Sutter Bypass

Implementation of Alternative A would result in the diversion of up to 5,900 cfs during winter flows. These diversions would occur at the T-C, GCID, and Delevan intake structures, all of which are located upstream of, and therefore would affect the hydrology of, the Sutter Bypass. The spills into the Bypass would consequently be reduced by up to 5,900 cfs, which would reduce the velocity and volume of water entering the Bypass, and could delay the point at which the weirs begin to spill.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Riparian and wetland habitats exist within the Sutter Bypass. Modifications of the existing flow regime of the Sutter Bypass could adversely affect these habitat types. The Sutter Bypass has water flowing through

it year round. A reduction of the frequency, velocity, and volume of floodwaters entering the Bypass from the Sacramento River as a result of implementation of Alternative A would reduce the amount of flooding, which could impact wetland and riparian habitat by reducing the duration of inundation. However, the riparian and wetland habitats within the bypass are adapted to various degrees of inundation. Therefore, the modification of the existing flow regime of the Sutter Bypass that would result in reduced frequency, velocity, and volume of floodwaters entering the Bypass as a result of implementing Alternative A would be relatively minor and would have a **less-than-significant impact** on riparian and wetland habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Approximately 80 percent of the Sutter NWR is located in the Sutter Bypass. The agricultural, riparian, and wetland habitats within the Sutter Bypass support numerous species of terrestrial wildlife, including a large mixed heron and egret rookery and the special-status giant garter snake, Swainson's hawk, white-tailed kite, bald eagle, western yellow-billed cuckoo, American white pelican, redhead, least bittern, western pond turtle, and State fully-protected ringtail. The open water habitat created during flooding can provide a similar value to migratory waterbirds as permanent wetlands. The flooding that occurs during high flow events can create deep water suitable for diving ducks. Raptor species forage in recently flooded areas. If the flooding is not substantial, low water levels provide shallow water habitat, which is valuable to wintering dabbling ducks, shorebirds, and wading birds. Modifications of the existing flow regime of the Sutter Bypass could adversely affect these species.

The Sutter Bypass has water flowing through it year round. A reduction of the frequency, velocity, and volume of floodwaters entering the Bypass from the Sacramento River as a result of implementation of Alternative A would reduce the amount of flooding that the refuge experiences, which at times can be up to 12 feet deep. This reduction in the frequency, velocity, and volume of water could benefit small mammals, reptiles, and amphibians because they would have an increased chance of reaching flood refugia before inundation. Therefore, the modification of the existing flow regime of the Sutter Bypass, although relatively minor, would result in reduced velocity and volume of floodwaters entering the Bypass as a result of implementing Alternative A, and would have a **potentially beneficial effect** to special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

The riparian habitat within the Sutter Bypass supports a large mixed heron and egret rookery. Because the relatively minor modification of the existing flow regime of the Sutter Bypass resulting from implementation of Alternative A would not be expected to have an adverse effect on riparian habitat or loss of the nesting colony, the change in flow regime would have a **less-than-significant impact** on the heron and egret rookery, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with changes to the flow regime of the Sutter Bypass. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Anticipated changes to the flow regime of the Sutter Bypass resulting from implementation of Alternative A would be within the historical range of operation and would not adversely affect wildlife or wildlife habitat. Consequently, these changes would not conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, have **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Yolo Bypass

Operational modeling for Alternative A indicates that there would be a minor reduction in the duration and magnitude of flows entering into the Yolo Bypass.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Riparian and wetland habitats exist within the Yolo Bypass. As floodwaters recede, mudflats are created and smaller areas of open water habitat may remain in the Bypass. A reduction of the frequency, velocity, and volume of floodwaters entering the Bypass as a result of implementation of Alternative A would reduce the amount of flooding, which could impact wetland and riparian habitat by reducing the duration of inundation. However, the riparian and wetland habitats within the bypass are adapted to various degrees of inundation. Therefore, the modification of the existing flow regime of the Yolo Bypass that would result in minor reductions in velocity and volume of floodwaters entering the Bypass as a result of implementation of Alternative A would have a **less-than-significant impact** on riparian and wetland habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The Yolo Bypass includes the Yolo WA. The agricultural, riparian, and wetland habitats within the Yolo Bypass support numerous species of terrestrial wildlife, including the special-status western pond turtle, American white pelican, bald eagle, Swainson's hawk, and greater sandhill crane. When the Bypass floods, the receding water creates mudflats that are used by many shorebird species. After floodwaters recede, smaller areas of open water habitat may remain in the Bypass that has the potential to support foraging waterbirds and raptors, as well as the western pond turtle. A minor reduction of the frequency, velocity, and volume of floodwaters entering the Bypass as a result of implementation of Alternative A would reduce the amount of flooding, which could impact wetland and riparian habitat by reducing the duration of inundation, and consequently impact the special-status species that use these habitat types. However, the riparian and wetland habitats within the bypass are adapted to various degrees of inundation. Therefore, the modification of the existing flow regime of the Yolo Bypass that would result

in reduced velocity and volume of floodwaters entering the Bypass as a result of implementing Alternative A would have a **less-than-significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. The modification of the existing flow regime of the Yolo Bypass that would result in reduced velocity and volume of floodwaters entering the Bypass as a result of implementing Alternative A would have a **less-than-significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with changes to the flow regime of the Yolo Bypass. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Anticipated changes to the flow regime of the Yolo Bypass resulting from implementation of Alternative A would be within the historical range of operation and would not adversely affect wildlife or wildlife habitat. Consequently, these changes would not conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, have **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

American River

Operational modeling indicates that implementation of Alternative A would have effects on the American River that are similar to those described for the Feather River. The operational flexibility provided by implementation of Alternative A would result in an American River flow regime that would be more consistent with hydrologic conditions, rather than reactive to Delta conditions. Consequently, when compared to Existing Conditions and the No Project/No Action Alternative, flows would generally be decreased during June through September with the largest reductions in July. However, when compared to the No Project/No Action Alternative, flows would be improved from June through September in drier years.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Valley foothill riparian and backwater habitats exist along the American River. Modifications to the existing flow regime have the potential to adversely affect these habitat types. However, implementation of Alternative A would return the river to a flow regime that is more stable during summer months. The higher flows that are released during summer months in Existing Conditions to improve Delta conditions have the potential to scour or inundate riparian habitat. Lower and more stabilized flows would reduce these risks. The lower and more stable summer flows resulting from implementation of Alternative A

would not be likely to have a substantial adverse effect on established riparian habitat, and could be beneficial in drier years from June through September when flows would be higher than the No Project/No Action Alternative. The reduced summer flows would also not be likely to adversely affect the hydrology of backwater habitats. Modification of the existing flow regime in the American River resulting from implementation of Alternative A would not be expected to adversely affect riparian habitat or reduce the habitat suitability of the riverine or backwater habitats, and would, therefore, have a **less-than-significant impact** on these wildlife habitats, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The riverine and valley foothill riparian habitats of the American River support numerous species of terrestrial wildlife, including special-status species. Giant garter snakes exist in backwater habitats, and the river is included in a portion of an identified recovery unit for this species. Western pond turtles and nesting bank swallows have been documented along this river. Modifications to the existing flow regime have the potential to adversely affect these species. However, implementation of Alternative A would return the river to a flow regime that is more stable during summer months. The higher flows that are released during summer months in Existing Conditions to improve Delta conditions have the potential to scour or inundate riparian habitat, as well as inundate portions of bank swallow colonies. Lower and more stabilized flows would reduce these risks. The lower summer flows resulting from implementation of Alternative A would not be likely to have a substantial adverse effect on established riparian habitat, and could be beneficial in drier years from June through September when flows would be higher than the No Project/No Action Alternative. Consequently, riparian-associated species would not be expected to be adversely affected. The reduced summer flows would also not be likely to adversely affect the hydrology of backwater habitats used by the giant garter snake, and the resulting reduction in the velocity and temperature of the summer river flows could be beneficial to this species. Because the modification of the existing flow regime in the American River resulting from implementation of Alternative A would not be expected to adversely affect riparian habitat or riparian-associated species, and would not be expected to reduce the habitat suitability of the riverine or backwater habitats, this change would have a **less-than-significant impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with flow regime changes on the American River. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Anticipated changes to the flow regime of the American River resulting from implementation of Alternative A would be within the historical range of operation and would not adversely affect wildlife or wildlife habitat. Consequently, these changes would not conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, have **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Sacramento-San Joaquin Delta

Operational modeling indicates that implementation of Alternative A would result in a flow reduction in the Delta in December and January, resulting in a 1 to 2 km shift in the position of X2. However, this shift would occur during Wet months when the X2 position is well within compliance of salinity standards for the Delta, and would, therefore, be within the recorded range of salinity tolerance for species present in the Delta. Modeling also indicates an improvement in salinity conditions in August through October, and increased inflows into the Delta during Critical years.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

The Sacramento-San Joaquin Delta contains sloughs, emergent wetlands, and saline wetlands. Modifications to the existing flow regime of the Delta could adversely affect these habitat types. However, because the modification of the flow regime associated with implementation of Alternative A would result in a shift in X2 that would be within the historical range of tolerance of these habitats, and because salinity conditions would be improved in August through October, as well as in Critical years, there would be a **less-than-significant impact** on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The Sacramento-San Joaquin Delta supports numerous wildlife species, including the special-status giant garter snake in the vicinity of Sherman Island, bank swallows along Seven-Mile and Three-Mile sloughs, the California black rail, the greater sandhill crane in emergent wetlands, and the salt marsh harvest mouse in saline wetlands. Modifications to the existing flow regime of the Delta could adversely affect these species. However, because the modification of the flow regime associated with implementation of Alternative A would result in a shift in X2 that would be within the historical range of tolerance of these species, and because salinity conditions would be improved in August through October, as well as in Critical years, there would be a **less-than-significant impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with flow regime changes in the Delta. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Anticipated changes to the flow regime of the Delta resulting from implementation of Alternative A would be within the historical range of operation and would not adversely affect wildlife or wildlife habitat. Consequently, these changes would not conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, have **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Suisun Bay

Operational modeling indicates that the diversions associated with implementation of Alternative A would increase electrical conductivity (EC), which is a measure of changes in salinity, in the Suisun Marsh in December. However, in Existing Conditions and the No Project/No Action Alternative, EC would be very low in December and the substantial increase in EC associated with Project operation would be within the historic range of species tolerance.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Suisun Bay and Marsh contains saline emergent wetlands. Modifications to the existing flow regime of the bay and marsh could adversely affect this habitat type. However, because the modification of the flow regime associated with implementation of Alternative A would result in an increase in EC that would be within the historic range of tolerance of this habitat type, there would be a **less-than-significant impact** on saline emergent wetlands, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Suisun Bay and Marsh support numerous wildlife species, including the special-status California clapper rail, California black rail, and the salt marsh harvest mouse. The majority of breeding California black rails is found in Suisun Marsh. Modifications to the existing flow regime of the bay and marsh could adversely affect these species. However, because the modification of the flow regime associated with implementation of Alternative A would result in an increase in EC that would be within the historic range

of tolerance of these species, there would be a **less-than-significant impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with changes to the Suisun Marsh flow regime. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Anticipated changes to the flow regime of Suisun Bay associated with implementation of Alternative A would be within the historical range of operation and would not adversely affect wildlife or wildlife habitat. Consequently, these changes would not conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, have no impact, when compared to Existing Conditions and the No Project/No Action Alternative.

San Pablo Bay and San Francisco Bay

Implementation of Alternative A is not expected to affect the hydrology of San Pablo and San Francisco bays.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

San Pablo and San Francisco bays contain saline emergent wetlands. Modifications of the existing flow regime of these bays could adversely affect this habitat type. However, because no effect to the bays' hydrology is expected from implementation of Alternative A, there would be **no impact** to saline emergent wetlands, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

San Pablo and San Francisco bays support numerous wildlife species, including the special-status California clapper rail, California black rail, and salt-marsh harvest mouse. Modifications of the existing flow regime of these bays could adversely affect these species. However, because no effect due to implementation of Alternative A is expected within San Pablo or San Francisco bays, there would be **no impact** to special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

No Project-related human disturbance would be associated with changes to the flow regime of San Pablo and San Francisco bays. Therefore, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Because implementation of Alternative A is not expected to affect the flow regime of San Pablo and San Francisco bays, there would be no conflict with any HCPs, NCCPs, or local ordinances, and would, therefore, be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

14.3.6.3 Primary Study Area – Alternative A

Construction, Operation, and Maintenance Impacts

Sites Reservoir Inundation Area and Sites Reservoir Dams

The construction of a 1.27-MAF Sites Reservoir requires the construction of Sites Dam, Golden Gate Dam, and seven saddle dams. Construction-related ground-disturbing activities, vegetation removal, and the subsequent filling of the reservoir, would result in the direct and permanent loss of wildlife habitats, or the direct conversion of wildlife habitats to lacustrine habitat (Table 14-7).

**Table 14-7
Acres of Wildlife Habitat Subject to Direct Permanent Loss from the Construction and Filling of the 1.27-MAF Sites Reservoir and Associated Dams: Alternative A**

Habitat	Permanent Loss (Acres)
Annual grassland	11,654.6
Blue oak woodland	353.5
Dryland grain and seed crops	206.9
Lacustrine	20.2
Pasture	61.0
Urban/disturbed	76.1
Valley foothill riparian	81.5
Valley oak woodland	3.4
TOTAL	12,457.2

In addition to the permanent loss of habitat, there would also be temporary disturbance of habitat associated with a construction disturbance area outside of the reservoir footprint. The construction disturbance area would be located on the northeast side of the reservoir in the vicinity of the proposed

Sites and Golden Gate dams, and could disturb as much as 1,000 acres of land. Disturbed areas would be restored to their original habitat type after construction is complete. The majority of wildlife habitat that would be disturbed in that area is annual grassland habitat, but disturbance of valley foothill riparian habitat could also occur.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Annual Grassland

Annual grassland habitat within the proposed footprint of Sites Reservoir and its dams provides foraging habitat for special-status species, such as the loggerhead shrike, northern harrier, tri-colored blackbird, and pallid bat. Annual grassland also provides burrowing and foraging habitat for the burrowing owl and American badger, and wintering habitat for the ferruginous hawk and prairie falcon. Annual grassland provides potential habitat for the western spadefoot, which was observed southwest of the reservoir footprint, but not within the footprint itself. Along the annual grassland/blue oak woodland edge, annual grassland provides foraging habitat for the golden eagle, long-eared owl, and white-tailed kite. The vernal pools within annual grassland provide foraging habitat for the long-billed curlew. Annual grassland also provides habitat for numerous general wildlife species. In the vicinity of Golden Gate Dam and within the potential construction disturbance area, there are two elderberry shrubs in the middle of annual grassland habitat. The permanent loss of 11,654.6 acres and the additional temporary disturbance of up to 1,000 acres of annual grassland habitat, resulting from the construction activities and filling of the reservoir associated with implementation of Alternative A, would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Blue Oak Woodland

Blue oak woodland habitat within the proposed footprint of Sites Reservoir and its dams provides nesting and foraging habitat for special-status species, such as the golden eagle, Lawrence's goldfinch, long-eared owl, and white-tailed kite, and wintering habitat for the prairie falcon. Blue oak woodland also provides roosting and foraging habitat for the pallid bat and western red bat, as well as burrowing and foraging habitat for American badger. Blue oak woodland also provides habitat for numerous general wildlife species. The permanent loss of 353.5 acres of blue oak woodland habitat resulting from the construction activities and filling of the reservoir associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Dryland Grain and Seed Crops

Dryland grain and seed crops habitat within the proposed footprint of Sites Reservoir and its dams may provide habitat for many species of rodents and birds that have adapted to this annual crop, and hawks, owls, and other predators that feed on the rodents, including the northern harrier. The permanent loss of 206.9 acres of dryland grain and seed crops habitat resulting from the construction activities and filling of the reservoir associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Lacustrine

The 20.2 acres of existing lacustrine habitat within the proposed reservoir footprint consists of man-made ephemeral stock ponds. The filling of Sites Reservoir would replace these stock ponds with more than

12,000 acres of lacustrine habitat. The new reservoir would create shoreline and shallow water habitat, as well as open water habitat. The increase in open water habitat associated with implementation of Alternative A would have a **potentially beneficial effect** on many common avian species by providing winter rafting habitat, when compared to Existing Conditions and the No Project/No Action Alternative. This habitat type could also create nesting opportunities for a few of these species (Table 14-8). In addition, the reservoir could provide foraging habitat for bats.

**Table 14-8
Avian Species Expected to Benefit from an Increase in Open Water Habitat within the Sites
Reservoir Inundation Area**

American coot	Cinnamon teal	Great blue heron*	Northern shoveler
American white pelican	Clark's grebe	Great egret	Osprey
American wigeon	Cliff swallow*	Greater scaup	Peregrine falcon
Bald eagle*	Common goldeneye	Green-winged teal	Pied-billed grebe
Barrow's goldeneye	Common loon	Herring gull	Redhead
Blue-winged teal	Common merganser*	Hooded merganser	Ring-billed gull
Bufflehead	Double-crested cormorant	Horned grebe	Ring-necked duck
California gull	Eared grebe	Killdeer*	Rock pigeon*
Canada goose	Eurasian wigeon	Lesser scaup	Ruddy duck
Canvasback	Forster's tern	Mallard	Spotted sandpiper
Caspian tern	Gadwall	Northern pintail	Western grebe

*Potential nesting opportunity for these species.

After filling, Sites Reservoir would be operated in a way that would cause frequent and often times severe drawdowns. The fluctuation of surface water elevation could impact wildlife that use the reservoir as a drinking source, as they would have to travel farther from the cover of adjacent habitat to reach the water. This increased travel distance can increase the risk of predation, especially for small mammals, reptiles, and amphibians. However, terrestrial wildlife within the area currently does not have access to a large permanent water source. Water sources around the rim of the proposed reservoir include seasonal wetlands, ephemeral streams, and stock ponds. Most stock ponds do not have year-round water. Wildlife could continue to use these existing water sources when the reservoir is drawn down. Therefore, the fluctuations of surface water elevations during operation of Sites Reservoir associated with implementation of Alternative A would have a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Pasture

Pasture habitat within the proposed footprint of Sites Reservoir and its dams provides potential wintering habitat for the special-status ferruginous hawk. When it is not overgrazed, pasture also provides potential habitat for ground-nesting birds and numerous general wildlife species. The permanent loss of 20.2 acres of pasture habitat resulting from construction activities and filling of the reservoir associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Urban/Disturbed

The urban/disturbed habitat within the footprint of Sites Reservoir and its dams provides marginal habitat for common wildlife species, including numerous non-native species. However, existing structures

located within urban/disturbed habitat within the Sites Reservoir footprint provide roosting habitat for bats, including a pallid bat maternity colony observed during field surveys. The demolition of these structures would adversely affect the maternity colony if demolition occurs before young are weaned and would adversely affect all roosting bat species if they are not excluded prior to demolition.

Therefore, the permanent loss of 76.1 acres of urban/disturbed habitat resulting from the construction activities and filling of the reservoir associated with implementation of Alternative A would be a **potentially significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Valley Foothill Riparian Habitat

Valley foothill riparian habitat within the proposed footprint of Sites Reservoir and its dams provides nesting and foraging habitat for special-status species, such as the bald eagle, long-eared owl, and yellow warbler, and provides roosting and foraging habitat for the western red bat. Valley foothill riparian also provides habitat for the western pond turtle, and potential habitat for the Swainson's hawk, which was observed adjacent to, but outside of, the footprint. When elderberry shrubs are present, valley foothill riparian provides habitat for the valley elderberry longhorn beetle. Valley foothill riparian also provides habitat for numerous general wildlife species. The permanent loss of 81.5 acres and the potential temporary disturbance of additional acreage of valley foothill riparian habitat, resulting from the construction activities and filling of the reservoir associated with implementation of Alternative A, would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Valley Oak Woodland Habitat

Valley oak woodland habitat within the proposed footprint of Sites Reservoir and its dams has the potential to provide nesting and foraging habitat for special-status species, such as the Lewis' woodpecker, roosting and foraging habitat for the pallid bat and western red bat, and wintering habitat for the prairie falcon. Valley oak woodland provides burrowing and foraging habitat for the American badger, and potential habitat for the Swainson's hawk, which was observed in an area adjacent to the reservoir footprint, but not within the footprint. However, the valley oak woodland within the reservoir footprint represents a small isolated patch of marginal habitat. Therefore, the permanent loss of 3.4 acres of valley oak woodland habitat resulting from the construction activities and filling of the reservoir associated with implementation of Alternative A would be a **potentially significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Bald Eagle

Construction-related ground-disturbing activities and vegetation removal, and the subsequent filling of the proposed reservoir, would result in the direct and permanent loss of the valley foothill riparian habitat that is used as bald eagle nesting and foraging habitat. No nests occur within the proposed reservoir footprint, but the construction of Golden Gate Dam would result in the indirect take of an established bald eagle nest tree, which is located immediately adjacent to the footprint of the dam and within the construction disturbance area. Bald eagles tend to use the same nest for multiple years, and the nesting pair at this

location has successfully reproduced in consecutive years. The disturbance or removal of this nest tree during the nesting season could result in the direct mortality of eggs or young, which would be a **significant impact**. If removed, the permanent loss of this nest tree would be a **significant impact** to bald eagles, when compared to Existing Conditions and the No Project/No Action Alternative.

The conversion of valley foothill riparian habitat to lacustrine habitat as a result of filling of the reservoir would provide new foraging habitat and an increase in prey for bald eagles, and the lacustrine/blue oak woodland edge could provide new roosting habitat. However, during operation, recreational boating on the reservoir and its associated noise, as well as the noise and disturbance associated with campground use, could make potential nesting habitat unsuitable or result in nest abandonment. The disturbance to bald eagles caused by recreation activities would be a **potentially significant impact** to bald eagles, when compared to Existing Conditions and the No Project/No Action Alternative.

Periodic maintenance activities, such as garbage removal, and maintenance of signs, culverts, and buoys, would not be expected to have a substantial adverse effect on bald eagles and would, therefore, have a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Golden Eagle

Construction-related ground-disturbing activities and vegetation removal, and the subsequent filling of the proposed reservoir, would result in the direct and permanent loss of annual grassland, blue oak woodland, and valley oak woodland habitat that is used by the golden eagle as nesting and foraging habitat. Golden eagles were observed foraging within the proposed reservoir footprint. This foraging habitat would be converted to lacustrine habitat, which is not suitable foraging habitat for golden eagles. Therefore, the loss of foraging habitat would be a **potentially significant impact** to golden eagles, when compared to Existing Conditions and the No Project/No Action Alternative.

Construction activities associated with the construction of Sites Dam could disturb an active golden eagle nest located adjacent to the construction footprint in Sites Canyon. Although the location of the nest does not have a direct line of sight to the dam construction disturbance area, and although the nest is already subject to traffic noise, construction activities associated with Sites Dam could have a **potentially significant impact** on these nesting golden eagles, when compared to Existing Conditions and the No Project/No Action Alternative.

During operation of the dam, the portion of the road that the nest is located along would be restricted to authorized vehicles only; public vehicle access would be eliminated. Operation- and maintenance-related traffic at the dam would have a **less-than-significant impact** on these nesting golden eagles, when compared to Existing Conditions and the No Project/No Action Alternative.

Valley Elderberry Longhorn Beetle

Construction-related ground-disturbing activities and vegetation removal, and the subsequent filling of the proposed reservoir, would result in the direct and permanent loss of 672 elderberry stems. Valley elderberry longhorn beetle emergence holes were observed on 18 of the surveyed stems. Four elderberry shrubs, which were not surveyed for emergence holes, are located within the footprint of Sites Dam and would consequently experience direct loss during construction of the dam. Outside of the reservoir footprint, but within the potential construction disturbance area, two elderberry shrubs exist within the annual grassland. Emergence holes were documented on one of these shrubs. The permanent loss of these

elderberry shrubs would be a **significant impact** to valley elderberry longhorn beetles, when compared to Existing Conditions and the No Project/No Action Alternative.

Western Burrowing Owl

Construction-related ground-disturbing activities and vegetation removal, and the subsequent filling of the proposed reservoir, would result in the direct and permanent loss of annual grassland and blue oak woodland habitat. Burrowing owls were observed within the reservoir footprint at the annual grassland/blue oak woodland edge. These habitat types would be converted to lacustrine habitat, which is unsuitable habitat for burrowing owls. The conversion of these habitat types to lacustrine habitat would, therefore, have a **potentially significant impact** on burrowing owls, when compared to Existing Conditions and the No Project/No Action Alternative.

Western Pond Turtle

Construction-related ground-disturbing activities and vegetation removal, and the subsequent filling of the proposed reservoir, would result in the direct and permanent loss of ponds and streams that are used by the western pond turtle. Pond turtles were observed within the reservoir footprint and at the Sites Dam site. This loss of habitat could adversely affect this species. In addition, construction activities and the subsequent filling of the reservoir could result in direct mortality to this species. During operation, the reservoir's lacustrine habitat has the potential to provide suitable pond turtle habitat along the shallow edges of the reservoir. However, the expected surface water elevation fluctuations associated with reservoir operation would reduce the potential habitat value and likely be unsuitable for this species. Therefore, the construction and operation of Sites Reservoir and Dams would have a **potentially significant impact** on western pond turtles, when compared to Existing Conditions and the No Project/No Action Alternative.

Because the reservoir's surface water elevation fluctuations would likely make the reservoir's lacustrine habitat unsuitable for pond turtles, the proposed maintenance activities (including law enforcement, garbage removal, and maintenance of signs, culverts, and buoys) would not be expected to have a substantial adverse effect on this species. Therefore, maintenance activities associated with Sites Reservoir and Dams would have a **less-than-significant impact** on western pond turtles, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion for impacts of dam construction on bald eagle nesting.

The proposed Sites Reservoir Inundation Area is used by a small resident deer herd. The herd makes small seasonal movements; it does not make large seasonal migrations to critical habitat areas. Construction activities within the reservoir footprint would not be expected to affect the movement of this herd. Construction activities at the dam sites would likely cause the herd to travel over the hillside rather than through the gap, but this change in travel route would not cause substantial interference to the herd's movements. Filling and operation of the reservoir would displace this herd into adjacent suitable habitat, and could restrict the herd's small seasonal movements. However, the deer herd would be able to travel around the rim of the reservoir, and could swim across the reservoir. Maintenance activities would not be expected to affect the movement of this herd. Therefore, the impact of interference to resident deer herd

movement caused by the construction, operation, and maintenance of Sites Reservoir and Dams would be **less than significant**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Wildlife and wildlife habitats may be directly or indirectly affected by Project-related construction and maintenance activities associated with the proposed Sites Reservoir and dams, as well as by recreation activities associated with reservoir operation. Construction activities would include the use of heavy equipment, and would result in increased traffic from the transportation of personnel and materials, which could lead to increased mortality from vehicles and increased disturbance from noise and artificial lighting. Recreational use of the reservoir would include the use of watercraft such as powerboats, fishing boats, personal watercraft, and canoes. Watercrafts have been documented to adversely impact waterfowl, as they can cause disturbance of foraging and rafting activity. Boats can be a major cause of foraging disturbance for bald eagles. Human activities that are documented to cause disturbance to wildlife include power-boating and water skiing; wind surfing, rowing, and canoeing; wading and swimming; and activities along shorelines such as fishing, bird watching, and hiking. Disturbance of wildlife can result in increased energy expenditure during flight responses, displacement, and increased predation of eggs or young if nesting birds are flushed from their nests for an extended period of time. High-speed boating can also cause shoreline degradation, resulting in reduced habitat suitability for some species. Therefore, human disturbance associated with construction, maintenance, and recreation at Sites Reservoir and dams would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

The Primary Study Area is not included in any HCPs or NCCPs. The Colusa County Voluntary Oak Woodlands Management Plan provides guidelines for voluntary participation, and Project mitigation for oak woodlands would exceed those guidelines. Therefore, there would be no conflict with this plan, and consequently **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Recreation Areas and Associated Electrical Distribution Lines

The proposed Antelope Island, Lurline Headwaters, Stone Corral, Peninsula Hills, and Saddle Dam recreation areas all have a footprint that represents the total area within which land-based recreation could occur. However, only approximately 15 percent of each footprint would experience a permanent loss of habitat as a result of the construction of facilities, such as boat ramps, picnic areas, roads, restroom facilities, and campgrounds. The remainder of the acreage could experience impacts from activities that would occur during Project operation and maintenance, such as hiking, camping in undesignated areas, firewood collection, fuelbreak and vegetation maintenance, and off-road vehicle or mountain bike use. Three of the Recreation Areas would also have transmission lines associated with them, and the temporary construction disturbance area for the electrical distribution lines is included in addition to the recreation area footprint acreage. The total acreage of wildlife habitat within each recreation area is presented in Table 14-9.

Table 14-9
Permanent Wildlife Habitat Loss and Temporary Disturbance Due to the Construction of the Recreation Areas and Associated Electrical Distribution Lines: Alternative A

Habitat	Total Number of Acres Affected					TOTAL Disturbance	Permanent Loss ^b
	Saddle Dam ^a	Peninsula Hills ^a	Stone Corral	Antelope Island	Lurline Headwaters ^a		
Annual grassland	271.6	78.2	132.8	12.3	79.2	574.1	86.1
Blue oak woodland	0	301.3	102.3	36.9	156.2	596.7	89.2
Chamise-redshank chaparral	0	0			1.0	1.0	0.2
Lacustrine	1.2	0	0	0	0 ^c	1.2	0.2
TOTAL	272.8	379.5	235.1	49.2	236.4	1,173.0	175.7

^aAcreage includes construction disturbance area for associated electrical distribution line.

^b Permanent loss is calculated as 15 percent of the total construction disturbance area.

^cThis facility has a small amount of lacustrine habitat, but the total amount is less than 0.1 acre.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Annual Grassland

Annual grassland habitat within the proposed footprint of each of the Recreation Areas does not contain vernal pools, but otherwise has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams. However, the Saddle Dam Recreation Area contains seasonal wetlands that are considered to be part of the annual grassland habitat. The special-status long-billed curlew and tri-colored blackbird were observed using this habitat, and foraging golden eagles were observed. The potential disturbance of up to 574.1 acres and permanent loss of approximately 86 acres of annual grassland habitat resulting from construction and the recreation activities associated with the operation of the Alternative A Recreation Areas would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Blue Oak Woodland

Blue oak woodland habitat within the proposed footprint of four of the five Recreation Areas has similar value to wildlife as described in the impact assessment for Sites Reservoir and Dams, although portions of the blue oak woodland on Antelope Island and Lurline Headwaters have an understory of mixed chaparral. The special-status American badger and golden eagle were observed within this habitat. The potential disturbance of up to 596.7 acres and permanent loss of approximately 89 acres of blue oak woodland habitat resulting from construction and the recreation activities associated with operation of the Alternative A Recreation Areas would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Chamise-Redshank Chaparral

Chamise-redshank chaparral habitat is located within the construction disturbance area associated with the proposed Lurline Headwaters Recreation Area. This chaparral provides potential habitat for Bell's sage sparrow, which was observed west of the Sites Reservoir footprint. The construction disturbance area

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represents an area of potential temporary disturbance that would be returned to chaparral habitat after completion of the Project. Because of the above-ground nature of transmission line construction, impacts to this habitat could be avoided. The potential disturbance of up to 1.0 acre of chamise-redshank chaparral habitat resulting from transmission line construction activities associated with implementation of the Alternative A Recreation Areas would have a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Lacustrine Habitat

The lacustrine habitat within the proposed footprint of two of the Recreation Areas is made up of man-made ephemeral stock ponds. The three ponds that exist within the footprint of the Saddle Dam Recreation Area are not located within an area designated for construction, but are spread out through the center of the recreation area footprint and could be subject to disturbance from recreation activities. The one pond that exists within the footprint of the Lurline Headwaters Recreation Area is located at the north edge of the recreation area footprint and is not located within an area designated for construction. The potential disturbance to the 1.2 acres of stock ponds could adversely impact terrestrial wildlife.

However, the inundation area of Sites Reservoir would be located immediately adjacent to these Recreation Areas, and implementation of Alternative A would provide over 12,000 acres of lacustrine habitat, including shoreline, shallow water, and open water habitat. The increase in adjacent lacustrine habitat could benefit the wildlife species that use these stock ponds. Therefore, the potential disturbance to these stock ponds resulting from recreation activities associated with operation of the Alternative A Recreation Areas would have a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Golden Eagle

The construction-related ground-disturbing activities, and the associated recreation activities that would occur during operation in the proposed Recreation Areas, would result in the direct and permanent loss or disturbance of annual grassland and blue oak woodland habitat that is used by golden eagles as nesting and foraging habitat. Golden eagles were observed foraging at the proposed Recreation Areas year round, and were observed nesting at Stone Corral, Lurline Headwaters, and Peninsula Hills recreation areas. The permanent loss or disturbance of annual grassland and blue oak woodland habitat resulting from construction and operation of the Recreation Areas would be a **significant impact** to golden eagles, when compared to Existing Conditions and the No Project/No Action Alternative.

Nest tree removal during construction, and the potential disturbance to nesting golden eagles from recreation activities that would occur during Project operation, or from maintenance activities, could cause nest abandonment or direct mortality to eggs or young, and therefore, would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion for the impacts of the Recreation Areas on nesting golden eagles.

Limited construction would occur within the proposed footprint of each recreation area. Permanent structures could include vault toilets, picnic tables, and boat ramps. Portions of the existing vegetation within the Recreation Areas could be cleared to provide hiking trails, campsites, and gravel parking areas. After construction is complete, it is possible that larger areas of disturbance, such as gravel parking lots or multiple-site campgrounds, could interfere with the movement of small mammals, reptiles, or amphibians due to the lack of vegetative cover. However, the surrounding native habitat would be preserved, and vegetation would be planted and maintained around these disturbed areas. These disturbed areas would not be expected to substantially interfere with the movement of resident wildlife species because those species would be able to travel around the areas of disturbance. Therefore, construction, operation, and maintenance of the Recreation Areas would have a **less-than-significant impact** on the movement of small mammals, reptiles, and amphibians, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Wildlife and wildlife habitats may be directly or indirectly affected by Project-related construction, maintenance, and recreation activities associated with the proposed Recreation Areas. Construction activities would include the use of heavy equipment, and would result in increased traffic from the transportation of personnel and materials, which could lead to increased mortality from vehicles and increased disturbance from noise and artificial lighting. Maintenance activities on roads, trails, and parking lots could involve grading or vegetation removal, which would involve the use of heavy equipment and cause increased disturbance from noise. Maintenance of the vault toilets would require large and noisy pumping trucks. Land-based recreation activities that occur outside of designated camping areas, hiking trails, or roads cause ground disturbance that could result in the loss of native vegetation and promote the establishment of non-native plant species, which can alter habitat suitability. The non-native landscaping that would be planted around campsites and parking areas, and the associated vegetation maintenance and weed control, including the potential use of herbicides, would alter habitat suitability. Recreational activity would result in the accumulation of garbage, which attracts non-native wildlife species and can increase human-wildlife conflicts. The availability of additional food can change the composition and population dynamics of native species, as more species such as raccoons, skunks, crows, and rodents would be attracted to the Recreation Areas. Reptiles and amphibians in and around the Recreation Areas could experience increased injury or mortality as a result of handling by humans. Unleashed dogs can also disturb, injure, or kill wildlife by flushing, chasing, or attacking. Dogs also have the potential to spread disease or parasites to other wildlife. Artificial nighttime lighting at the Recreation Areas could cause resident wildlife to avoid the area, and could adversely affect reptiles and amphibians that breed and forage nocturnally. Wildlife viewing and photography can disturb wildlife as a result of frequent encounters of a long duration and attempts to approach wildlife. The increased noise from human activity could disturb the special-status species that are found within the Recreation Areas, and could, for example, lead to golden eagle nest abandonment and the incidental loss of fertile eggs or young. The human disturbance associated with the construction, maintenance, and recreational use during Project operation of the Recreation Areas would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-5** discussion for Sites Reservoir Inundation Area and Sites Reservoir Dams.

Road Relocations and South Bridge

Construction of the proposed road relocations would require a 100-foot-wide buffer on each side of the road, measured from the roadway centerline, which would result in the temporary disturbance of wildlife habitat. Disturbed areas would be restored to their original habitat type after construction is completed. The roads would be fenced on both sides, as most are now. The affected habitat types and total acreage impacted for each habitat type are listed in Table 14-10. Acreage for the proposed South Bridge is not included in this analysis because the bridge's on-the-ground footprint (i.e., bridge piers) and its construction disturbance area would be within the footprint of Sites Reservoir; the acreage is, therefore, already accounted for in the permanent loss of habitat associated with the proposed reservoir.

Table 14-10
Permanent Wildlife Habitat Loss and Temporary Disturbance Due to the Construction of the Road Relocations and South Bridge: Alternative A

Habitat	Total Number of Acres Affected	Permanent Loss* (Acres)
Annual grassland	719.9	216.0
Blue oak woodland	195.8	58.7
Canal	0.6	0.2
Chamise-redshank chaparral	1.5	0.4
Dryland grain and seed crops	15.9	4.8
Lacustrine	0.5	0.2
Mixed chaparral	2.6	0.8
Urban/disturbed	9.7	2.9
Valley foothill riparian	4.2	1.3
TOTAL	950.7	285.3

*Permanent loss is calculated as 30 percent of the total construction disturbance area.

The permanent loss of wildlife habitat resulting from the proposed footprint of the roads and the required cut and fill would be approximately 285 acres. The majority of the habitat acreage affected by construction of the roads would be annual grassland habitat and blue oak woodland habitat.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Annual Grassland

Annual grassland habitat within the proposed footprint and construction disturbance area of the road relocations has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams. The special-status long-billed curlew, prairie falcon, tri-colored blackbird, white-tailed kite, American badger, and pallid bat were observed within this habitat along the North Road and/or Southeast Road. The loggerhead shrike, white-tailed kite, golden eagle, northern harrier, tri-colored blackbird, and long-billed curlew were observed within this habitat type along the Eastside Road. The temporary disturbance of 719.9 acres, of which up to 285 acres could represent a permanent loss, of annual grassland habitat resulting from road construction activities associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Blue Oak Woodland

Blue oak woodland habitat within the proposed footprint and construction disturbance area of the road relocations has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams. The special-status Lewis' woodpecker, western red bat, and American badger were observed in this habitat along the North and/or Southeast Road. The temporary disturbance of 195.8 acres, all of which could represent a permanent loss, of blue oak woodland habitat resulting from road construction activities associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Canal

The construction of a bridge would be required where the proposed footprint and construction disturbance area of the road relocations would cross existing canals. Because no loss of canal habitat or disturbance of the main channel of any canal would occur as a result of road construction associated with implementation of Alternative A, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Chamise-Redshank Chaparral

Chamise-redshank chaparral habitat within the proposed footprint and construction disturbance area of the road relocations has the same value to wildlife as described in the impact assessment for the Recreation Areas. The temporary disturbance of 1.5 acres or potential permanent loss of chamise-redshank chaparral habitat, resulting from road construction activities associated with implementation of Alternative A, would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Dryland Grain and Seed Crops

Dryland grain and seed crops habitat within the proposed footprint and construction disturbance area of the road relocations has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams. The special-status Swainson's hawk was observed foraging, and sandhill cranes were observed flying, over this habitat type along the Southeast Road. The temporary disturbance of 15.9 acres or potential permanent loss of dryland grain and seed crops habitat, resulting from road construction activities associated with implementation of Alternative A, would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Lacustrine

The lacustrine habitat within the proposed footprint and construction disturbance area of the road relocations has the same value to wildlife as described in the impact assessment for the Recreation Areas. The construction disturbance areas for Lurline Road and Com Road converge east of the Lurline Headwaters Recreation Area. At the point of convergence, the disturbance areas overlap with a pond that is located within blue oak woodland habitat. Several other stock ponds are located adjacent to, but outside of, the construction disturbance area of other road segments. The temporary disturbance of up to 0.5 acre of lacustrine habitat resulting from road construction activities associated with implementation of Alternative A would not be expected to adversely affect wildlife, and would, therefore, have a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Mixed Chaparral

The mixed chaparral habitat within the proposed footprint and construction disturbance area of the road relocations has the potential to support numerous species of terrestrial wildlife, including Bell's sage sparrow, which was observed west of the Sites Reservoir footprint along a formerly proposed road route. The temporary disturbance of 2.6 acres or potential permanent loss of mixed chaparral habitat, resulting from road construction activities associated with implementation of Alternative A, would have a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Urban/Disturbed

The urban/disturbed habitat within the proposed footprint and construction disturbance area of the road relocations has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams. Although construction of the proposed South Bridge could provide roosting habitat for bats if niches are incorporated into the design, construction of the proposed roads could require the demolition of a few existing structures that may provide roosting habitat for bats. Therefore, the temporary disturbance of 9.7 acres or potential permanent loss of urban/disturbed habitat, resulting from road construction activities associated with implementation of Alternative A, would be a **potentially significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Valley Foothill Riparian

Valley foothill riparian habitat within the proposed footprint and construction disturbance area of the road relocations has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams. The special-status western pond turtle was observed within this habitat type along Stone Corral Creek. The temporary disturbance of 4.2 acres or potential permanent loss of valley foothill riparian habitat, resulting from road construction activities associated with implementation of Alternative A, would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Valley Elderberry Longhorn Beetle

There are more than 60 elderberry shrubs along Stone Corral Creek within 100 feet of Maxwell Sites Road, located approximately 0.5 to 0.75 mile northwest from the road's intersection with the proposed Eastside Road. There is also one shrub within 100 feet of the road located approximately 0.5 mile southeast of the same intersection. Although construction would not occur on Maxwell Sites Road, construction vehicles and equipment would use this road. The expected increase in recreational visitors to the area would also increase the use of this road. Traffic associated with maintenance activities is expected to be minimal, resulting in a **less-than-significant impact** on elderberry shrubs, when compared to Existing Conditions and the No Project/No Action Alternative.

The increase in construction and recreation traffic associated with construction and operation of Alternative A has the potential to adversely affect these elderberry shrubs by increasing the amount of dust in the area. Increased dust would have a **potentially significant impact** on elderberry shrubs, when compared to Existing Conditions and the No Project/No Action Alternative.

Western Burrowing Owl

Construction-related ground-disturbing activities associated with the proposed road relocations would result in the permanent loss and temporary disturbance of annual grassland habitat. Burrowing owls were observed along the proposed North Road and Eastside Road in the vicinity of road cuts. Due to their proximity to the road, vehicle collisions with this species could increase due to increased recreation and maintenance traffic on existing and proposed new roads. The loss of annual grassland habitat during Project construction, as well as the increased traffic associated with operation and maintenance activities resulting from implementation of Alternative A, would be a **potentially significant impact** to burrowing owls, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion for the potential impact of roads on western burrowing owl movement.

In addition, construction of new roads can result in habitat fragmentation or reduced habitat connectivity. Improvement (such as from gravel to asphalt) or widening of existing roads can make it more difficult for small mammals, reptiles, or amphibians to cross them. However, each of the proposed new roads would be two-lane roads that, combined with their shoulders, are only approximately 60 feet wide. The roads would, therefore, not be expected to prohibit wildlife movement. Roadside fencing can also restrict wildlife movement. However, the fencing along existing roads and fencing that would be constructed along new roads consist of barbed wire fencing that does not obstruct the movement of these wildlife species. Construction of the roads associated with implementation of Alternative A would, therefore, have a **less-than-significant impact** on wildlife movement, when compared to Existing Conditions and the No Project/No Action Alternative.

Increased traffic associated with the operation and maintenance of the roads could result in increased mortality for individual wildlife species traveling across or basking on the roads. However, the mortality rate would not be expected to increase to a level that would adversely affect local populations. Therefore, the increased traffic associated with the operation and maintenance of the roads would have a **less-than-significant impact** on wildlife movement, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Wildlife and wildlife habitats may be directly or indirectly affected by Project-related construction, operation, and maintenance of the roads and bridge. Construction activities would include the use of heavy equipment, and would result in increased traffic from the transportation of personnel and materials, which could lead to increased mortality from vehicles and increased disturbance from noise and artificial lighting.

Road maintenance could include grading, vegetation removal, railing repairs, and repaving. Bridge maintenance activities could include safety inspections, redecking, and repainting. Many of these activities involve the use of heavy equipment and cause increased disturbance from noise. Depending on design, the completed bridge has the potential to support nesting birds and roosting bats, including the

special-status pallid bat. Maintenance activities on the bridge have the potential to adversely affect these species, especially if it is conducted during the breeding season.

During Project operation, the bridge and portions of the roads would have permanent nighttime safety lighting. Bridge and road lighting could cause resident wildlife to avoid the area, and could adversely affect nocturnal wildlife such as bats, owls, and frogs. Project operation would result in increased traffic on the roads, as well as on the bridge in a location where traffic does not currently travel. Increased traffic could lead to increased mortality from vehicles and increased disturbance from noise and artificial lighting. Human disturbance associated with construction, operation, and maintenance of the South Bridge and roads would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-5** discussion for Sites Reservoir Inundation Area and Sites Reservoir Dams.

Sites Pumping/Generating Plant, Sites Electrical Switchyard, Sites Reservoir Inlet/Outlet Structure, and Field Office Maintenance Yard

The construction of the proposed Sites Pumping/Generating Plant, Sites Reservoir Inlet/Outlet Structure, Sites Electrical Switchyard, and the Field Office Maintenance Yard would require ground-disturbing activities that would result in the direct and permanent loss of wildlife habitats (Table 14-11).

**Table 14-11
Acres of Wildlife Habitat Subject to Direct and Permanent Habitat Loss from Construction of the Sites Pumping/Generating Plant, Sites Reservoir Inlet/Outlet Structure, Sites Electrical Switchyard, and the Field Office Maintenance Yard: Alternative A**

Habitat	Permanent Loss (Acres)
Annual grassland	81.6
Lacustrine	0.2
Urban/disturbed	4.3
Valley foothill riparian	3.1
TOTAL	89.2

Additional acreage of temporary disturbance (9 acres) would occur as a result of a construction disturbance area for these proposed facilities. Disturbed areas would be restored to their original habitat type after construction is complete. The majority of wildlife habitat affected by these facilities and their construction disturbance areas would be annual grassland habitat.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Annual Grassland

Annual grassland within the proposed footprint of each of these facilities has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams. The permanent loss of 81.6 acres and

the potential temporary disturbance of an additional 9 acres of annual grassland habitat, resulting from the construction of these facilities associated with implementation of Alternative A, would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Lacustrine

The lacustrine habitat that is located within the proposed footprint of the Sites Reservoir Inlet/Outlet Structure consists of a man-made ephemeral stock pond. However, the existing Funks Reservoir is located adjacent to this structure and provides over to 220 acres of lacustrine habitat, including shoreline, shallow water, and open water habitat. Therefore, the loss of 0.2 acre of lacustrine habitat resulting from the construction of these facilities associated with implementation of Alternative A would be a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Urban/Disturbed

The urban/disturbed habitat within the proposed footprint of these facilities (i.e., Sites Pumping/Generating Plant, Sites Reservoir Inlet/Outlet Structure, Sites Electrical Switchyard, and the Field Office Maintenance Yard) has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams. Construction of the proposed outlet structure would require the demolition of a few existing structures that may provide roosting habitat for bats. Therefore, the permanent loss of 4.3 acres of urban/disturbed habitat resulting from the construction of these facilities associated with implementation of Alternative A would be a **potentially significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Valley Foothill Riparian

Valley foothill riparian habitat within the proposed footprint of these facilities (i.e., Sites Pumping/Generating Plant, Sites Reservoir Inlet/Outlet Structure, Sites Electrical Switchyard, and the Field Office Maintenance Yard) has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams, with the exception of elderberry shrubs, which are not present within the footprint of any of these facilities. The permanent loss of 3.1 acres of valley foothill riparian habitat resulting from the construction of these facilities associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

No special-status species were observed within the vicinity of the proposed footprint of the Sites Reservoir Inlet/Outlet Structure or associated facilities. Therefore, construction, operation, and maintenance activities associated with implementation of Alternative A in this area would be expected to have a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

It is possible that the construction and operation of these proposed facilities could interfere with the movement of small mammals, reptiles, or amphibians. However, more than 90 percent of the disturbance would occur in annual grassland habitat, and the surrounding grassland habitat would be preserved. These facilities would not be expected to substantially interfere with the movement of resident wildlife species because those species would be able to travel around the areas of disturbance. Maintenance activities, including vehicle access to these facilities, would not be expected to substantially interfere with wildlife movement. Therefore, construction, operation, and maintenance of these facilities associated with implementation of Alternative A would have a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Wildlife and wildlife habitats may be directly or indirectly affected by Project-related construction, operation, and maintenance of these facilities. Construction activities would include the use of heavy equipment, and would result in increased traffic from the transportation of personnel and materials, which could lead to increased mortality from vehicles and increased disturbance from noise and artificial lighting. Operation and maintenance would require frequent vehicle access to these facilities, and may require nighttime safety lighting, which can adversely affect many wildlife species, especially nocturnal species. Pump operation could result in increased noise levels that may adversely affect wildlife. Therefore, the human disturbance associated with construction, operation, and maintenance of these facilities resulting from implementation of Alternative A would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-5** discussion for Sites Reservoir Inundation Area and Sites Reservoir Dams.

Tunnel from Sites Pumping/Generating Plant to Sites Reservoir Inlet/Outlet Structure

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

The proposed footprint for the tunnel from the Sites Pumping/Generating Plant to the Sites Reservoir Inlet/Outlet Structure would be drilled and would not have any above-ground disturbance associated with it. Staging areas would occur at either end of the tunnel within the construction footprint of the Sites Pumping/Generating Plant and the Sites Reservoir Inlet/Outlet Structure. These staging areas are addressed in the impact analysis for those facilities. The tunnel would be operated remotely, and maintenance activities would not occur above ground. Therefore, construction, operation, and maintenance of the tunnel would have **no impact** on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

No special-status species were observed within the vicinity of the proposed construction footprint of the tunnel. Because no above-ground disturbance would occur during construction, operation would occur remotely, and maintenance activities would not occur above ground, these activities associated with the tunnel would be expected to have **no impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Wildlife and wildlife habitats may be directly or indirectly affected by Project-related construction and maintenance of the tunnel and inlet/outlet structure. Construction activities would include the use of heavy equipment, and would result in increased traffic from the transportation of personnel and materials, which could lead to increased mortality from vehicles and increased disturbance from noise and artificial lighting. Operation and maintenance would require vehicle access to these facilities, and may require nighttime safety lighting, which can adversely affect many wildlife species, especially nocturnal species. Therefore, the human disturbance associated with the construction, operation, and maintenance of these facilities resulting from implementation of Alternative A would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-5** discussion for Sites Reservoir Inundation Area and Sites Reservoir Dams.

Holthouse Reservoir Complex and Holthouse Reservoir Electrical Switchyard

The construction of the Holthouse Reservoir Complex would require the dredging of Funks Reservoir. The existing Funks Reservoir provides up to 228 acres of lacustrine habitat and more than three miles of associated shoreline. The reservoir would be drained for approximately two years, with construction activities occurring during months other than November through April.

Construction of the rest of the proposed Holthouse Reservoir Complex and Holthouse Reservoir Electrical Switchyard would result in the direct and permanent loss of the following wildlife habitats, with the exception of the Holthouse to T-C Canal Pipeline, which would result in the temporary disturbance of wildlife habitat (Table 14-12).

Table 14-12
Permanent Wildlife Habitat Loss and Temporary Disturbance Due to the Construction of the Holthouse Reservoir Complex and Holthouse Reservoir Electrical Switchyard: Alternative A

Habitat	Temporary Disturbance ^a (Acres)	Permanent Loss (Acres)
Annual grassland	9.7	112.7
Canal	0.4	7.3
Dryland grain and seed crops	0	60.5
Fresh Emergent Wetland ^b	0	0.5
Irrigated row and field crops	14.2	151.8
Urban/disturbed	0	0.6
Valley foothill riparian	0	7.0
TOTAL	24.3	340.4

^aAcreage represents temporary disturbance associated with the defined construction disturbance area of the Holthouse to T-C Canal Pipeline.

^bFresh Emergent Wetland includes alkaline wetland.

Additional acreage of temporary disturbance would occur as a result of a construction disturbance area for these proposed facilities. The construction disturbance areas for the Delevan Transmission Line and the Delevan and TRR pipelines are located adjacent to the footprint of these facilities. The construction disturbance area acreage for the Holthouse Reservoir Complex would be approximately 36 acres in size, but could overlap with the pipeline disturbance area. Disturbed areas would be restored to their original habitat type after construction is complete. The majority of wildlife habitat affected by these facilities and their construction disturbance area would be irrigated row and field crops, followed by annual grassland and dryland grain and seed crops habitat.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Annual Grassland

Annual grassland within the footprint of the proposed Holthouse Reservoir facilities has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams. Northern harriers and white-tailed kites were observed foraging over this habitat within the footprint of the reservoir. The permanent loss of 112.7 acres and the potential additional temporary disturbance of annual grassland habitat, resulting from the construction of these facilities associated with implementation of Alternative A, would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Canal

Canal habitat within the proposed footprint of the Holthouse Reservoir facilities consists of a portion of the existing concrete-lined T-C Canal. Wildlife species observed using this habitat within the construction footprint include the double-crested cormorant, mallard, and river otter. Killdeer are usually present along the canal's levee. A portion of the canal would be relocated, and the previous location would be converted to lacustrine habitat. The conversion of 7.3 acres of canal habitat to lacustrine habitat resulting from the construction of these facilities and the filling of the reservoir associated with implementation of

Alternative A would be a **less-than-significant** impact, when compared to Existing Conditions and the No Project/No Action Alternative.

Dryland Grain and Seed Crops

Dryland grain and seed crops habitat within the proposed footprint of the Holthouse Reservoir facilities has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams. The permanent loss of 60.5 acres and the potential additional temporary disturbance of dryland grain and seed crops habitat, resulting from the construction of these facilities associated with implementation of Alternative A, would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Fresh Emergent Wetland

The fresh emergent wetland wildlife habitat within the Holthouse Reservoir Complex footprint is represented by an alkaline wetland swale within the annual grassland. This wetland habitat has the potential to support numerous species of wildlife. Construction of the Holthouse Reservoir Complex would result in the permanent loss of 0.5 acre of this habitat type, and could result in the disruption of the water supply to this alkaline wetland. Therefore, the permanent loss of up to 0.5 acre of fresh emergent wetland habitat, and the potential disruption of its hydrology, resulting from construction of the Holthouse Reservoir Complex, would be a **potentially significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Irrigated Row and Field Crops

Irrigated row and field crops habitat within the proposed footprint of the Holthouse Reservoir facilities provides foraging habitat for the northern harrier. The permanent loss of 151.8 acres, and the potential additional temporary disturbance of irrigated row and field crops habitat resulting from the construction of these facilities associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Lacustrine

The existing Funks Reservoir is used extensively by many water-dependent species of waterfowl and shorebirds, including the American bittern, American coot, black-necked stilt, canvasback, double-crested cormorant, great blue heron, killdeer, northern shoveler, wood duck, and five species of grebes. The projected two-year absence of lacustrine habitat and associated shoreline habitat at the reservoir during Project construction would eliminate habitat that has been available to these water-dependent avian species since 1976. However, the reservoir would be drained during the non-breeding season, and nearby East Park, Stony Gorge, and Indian Valley reservoirs, the Delevan and Sacramento NWRs, and the adjacent rice fields could be used during the period of construction. The lacustrine habitat would be restored after construction is complete. Therefore, Funks Reservoir dredging associated with implementation of Alternative A would have a **less-than-significant impact** on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Urban/Disturbed

The urban/disturbed habitat that is located within the proposed footprint of the Holthouse Reservoir facilities consists of the existing Funks Dam maintenance road. The gravel road provides little habitat value for wildlife. Therefore, the permanent loss of 0.6 acre of urban/disturbed habitat resulting from the

construction of the Holthouse Reservoir Complex associated with implementation of Alternative A would be a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Valley Foothill Riparian

Valley foothill riparian habitat within the proposed footprint of the Holthouse Reservoir facilities has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams, with the exception of elderberry shrubs, which are not present within the footprint of this complex of facilities. Nesting great horned owls and red-tailed hawks were observed in this habitat within the footprint of the reservoir. The permanent loss of 7.0 acres of valley foothill riparian habitat resulting from the construction of these facilities associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The existing Funks Reservoir is used by the special-status American white pelican, common loon, and long-billed curlew. The projected two-year absence of lacustrine habitat and associated shoreline habitat at the reservoir during Project construction would eliminate habitat that has been available to these water-dependent avian species since 1976. However, nearby East Park, Stony Gorge, and Indian Valley reservoirs could be used during the period of maintenance, and the lacustrine habitat would be restored after construction is complete. Operation and maintenance impacts would be expected to be the same as for the existing Funks Reservoir. Therefore, Funks Reservoir dredging associated with implementation of Alternative A would have a **less-than-significant impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Western Pond Turtle

Western pond turtles were observed downstream of Funks Reservoir along Funks Creek in an area that would be within the proposed footprint of the Holthouse Reservoir Complex. Construction activities and the subsequent filling of the reservoir would result in habitat loss and could result in direct mortality of this species. Therefore, construction activities and inundation associated with the Holthouse Reservoir Complex resulting from implementation of Alternative A would have a **potentially significant impact** on western pond turtles, when compared to Existing Conditions and the No Project/No Action Alternative.

During operation of the reservoir, releases would be made downstream to the remaining Funks Creek channel to maintain flows. Operation and maintenance impacts would be expected to be the same as for the existing Funks Reservoir. Therefore, operation and maintenance of the Holthouse Reservoir Complex would have a **less-than-significant impact** on the western pond turtle, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

The existing Funks Reservoir is used by a few pair of nesting western grebes annually. The projected two-year absence of lacustrine habitat and associated shoreline habitat at the reservoir during construction would eliminate habitat that has been available to these water-dependent grebes since 1976. However, the

reservoir would be drained during the non-breeding season and nearby East Park, Stony Gorge, and Indian Valley reservoirs could be used during the period of construction. The lacustrine habitat would be restored after construction is complete. Therefore, Funks Reservoir dredging associated with implementation of Alternative A would have a **less-than-significant impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

After Project construction is complete, it is possible that larger areas of disturbance associated with the Holthouse Reservoir Complex and Holthouse Reservoir Electrical Switchyard could interfere with the movement of small mammals, reptiles, or amphibians. However, almost 80 percent of the disturbance would occur in annual grassland habitat and irrigated row and field crops. The surrounding grassland and field crop habitat would be preserved. The reservoir complex would not be expected to substantially interfere with the movement of resident wildlife species because those species would be able to travel around the areas of disturbance. Therefore, construction, operation, and maintenance of these facilities associated with implementation of Alternative A would have a **less-than-significant impact** on wildlife movement, when compared to Existing Conditions and the No Project/No Action Alternative.

Additionally, filling Holthouse Reservoir would effectively enlarge the surface area of Funks Reservoir. If emergent vegetation is present, the larger reservoir size and increased availability of shallow water habitat could benefit the western grebes that already nest at Funks Reservoir. This potential increase in available nesting habitat associated with implementation of Alternative A would have a potentially **beneficial effect** on nesting western grebes, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Wildlife and wildlife habitats may be directly or indirectly affected by Project-related construction, operation, and maintenance of the proposed Holthouse Reservoir Complex. Construction activities would include the use of heavy equipment, and would result in increased traffic from the transportation of personnel and materials, which could lead to increased mortality from vehicles and increased disturbance from noise and artificial lighting. Operation and maintenance would require frequent vehicle access to these facilities, and may require nighttime safety lighting, which can adversely affect many wildlife species, especially nocturnal species. Therefore, the human disturbance associated with construction, operation, and maintenance of the Holthouse Reservoir Complex resulting from implementation of Alternative A would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-5** discussion for Sites Reservoir Inundation Area and Sites Reservoir Dams.

Glenn-Colusa Irrigation District Canal Facilities Modifications

Proposed modifications to the existing GCID Canal Facilities would require associated construction disturbance areas that would create a temporary disturbance to wildlife habitats (Table 14-13).

Table 14-13
Temporary Disturbance of Wildlife Habitat Due to Modifications of the
Glenn-Colusa Irrigation District Canal Facilities: Alternative A

Habitat	Temporary Disturbance (Acres)
Canal (existing GCID Canal)	3.1
Urban/disturbed	1.6
TOTAL	4.7

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Canal

Canal habitat within the proposed construction disturbance area of the GCID Canal Facilities Modifications consists of a portion of the existing GCID Canal. The canal would be dewatered to line 200 feet of it, so the open water portion of that section would be lost during construction. However, construction would occur during the annual maintenance period when the canal is already dewatered. Therefore, the temporary disturbance of approximately three acres of canal habitat resulting from canal modifications associated with implementation of Alternative A would be a **less-than-significant** impact, when compared to Existing Conditions and the No Project/No Action Alternative.

Urban/Disturbed

The urban/disturbed habitat that is located within the proposed construction disturbance area of the GCID Canal Facilities Modifications consists of roads and a railroad, which provide little habitat value for wildlife. Therefore, the temporary disturbance of almost two acres of urban/disturbed habitat resulting from the canal modifications associated with implementation of Alternative A would be a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Giant Garter Snake

Areas of giant garter snake habitat exist within 200 feet of the GCID Canal. Proposed construction activities have the potential to disturb giant garter snakes or cause direct mortality from excavation of hibernating snakes if work is conducted from October 1 through May 1. Construction activities associated with modification of the GCID Canal resulting from implementation of Alternative A would, therefore, have a **potentially significant impact** on the giant garter snake, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Proposed canal modifications would occur within the existing canal or siphon locations and would have small associated construction disturbance areas for a temporary period of time. After construction is

complete, the areas would be returned to their original condition. Because construction activities would occur along a maintained canal and at a railroad track siphon, where disturbance is frequent, modifications to these facilities associated with implementation of Alternative A would be expected to have a **less-than-significant impact** on wildlife movement, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Wildlife and wildlife habitats may be directly or indirectly affected by the proposed construction activities associated with GCID Canal Modifications. Increased vehicle traffic associated with the transportation of personnel and materials to the site, as well as the noise associated with construction equipment and personnel, could cause temporary disturbance to wildlife. Therefore, the human disturbance associated with construction activities at the GCID Canal modifications resulting from implementation of Alternative A would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-5** discussion for Sites Reservoir Inundation Area and Sites Reservoir Dams.

Terminal Regulating Reservoir, Terminal Regulating Reservoir Pumping/Generating Plant, Terminal Regulating Reservoir Electrical Switchyard, and Glenn-Colusa Irrigation District Canal Connection to the Terminal Regulating Reservoir

Construction of the proposed TRR, TRR Pumping/Generating Plant, TRR Electrical Switchyard, and GCID Canal Connection to the TRR facilities would require ground-disturbing activities that would result in the direct and permanent loss of wildlife habitats (Table 14-14).

**Table 14-14
Permanent Wildlife Habitat Loss and Temporary Disturbance Due to the Construction of the
Terminal Regulating Reservoir Facilities: Alternative A**

Habitat	Temporary Disturbance* (Acres)	Permanent Loss (Acres)
Canal	0	0.9
Deciduous orchard	0	0.6
Dryland grain and seed crops	0	60.8
Pasture	0	11.7
Rice	13.6	120.9
Urban/disturbed	0.8	
TOTAL	14.4	194.9

*Acreage represents temporary disturbance associated with the defined construction disturbance area of the TRR to Funks Creek Pipeline.

Additional temporary disturbance of wildlife habitat would occur as a result of a construction disturbance area for these facilities. Construction disturbance associated with the proposed TRR to Funks Creek Pipeline would also be temporary. Two sides of the proposed reservoir would be surrounded by the construction disturbance area for the Delevan and TRR pipelines, which overlaps with the footprint of the reservoir. The construction disturbance area acreage would be approximately 19 acres in size, but could overlap with the pipeline disturbance area. Disturbed areas would be restored to their original habitat type

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after construction is complete. The majority of wildlife habitat affected by these facilities is rice habitat, followed by dryland grain and seed crops.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Canal

The existing GCID Canal is within the proposed footprint of the bay associated with the GCID Canal Connection to the TRR. The canal would still exist upstream and downstream of this bay, and the portion of the canal that would be within the proposed footprint of the connection would be expanded during the annual maintenance period for the canal when the canal is dewatered. This modification of the canal associated with implementation of Alternative A would not be expected to adversely affect wildlife, and therefore, would have a **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Deciduous Orchard

Deciduous orchards are used by numerous wildlife species. It is possible that the permanent loss of 0.6 acre of deciduous orchard habitat resulting from the construction of the TRR facilities could be avoided by revising the siting of the facilities. Due to the small amount of acreage that could be lost, and due to the possibility of avoiding this loss, the potential loss of deciduous orchard associated with construction of the TRR facilities would have a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Dryland Grain and Seed Crops

Dryland grain and seed crops habitat within the proposed footprint of these facilities has the same habitat value to wildlife as described in the impact assessment for Sites Reservoir and Dams. The permanent loss of 60.8 acres and the potential additional temporary disturbance of dryland grain and seed crops, resulting from the construction of these facilities associated with implementation of Alternative A, would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Pasture

Pasture habitat within the proposed footprint of these facilities has the same habitat value to wildlife as described in the impact assessment for Sites Reservoir and Dams. The permanent loss of 11.7 acres of pasture habitat resulting from the construction of these facilities associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Rice

Rice habitat, especially when flooded, supports numerous species of wildlife. The special-status sandhill crane, black tern, Caspian tern, long-billed curlew, yellow-headed blackbird, long-eared owl, short-eared owl, and white-tailed kite were observed using this habitat within or adjacent to the proposed footprint of these facilities. The permanent loss of 120.9 acres and the potential additional temporary disturbance of rice habitat, resulting from the construction of these facilities associated with implementation of Alternative A, would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Urban/Disturbed

The urban/disturbed habitat within the proposed footprint of these facilities consists of maintenance roads. These roads provide little habitat value for wildlife. Therefore, the temporary disturbance of 0.8 acre of urban/disturbed habitat resulting from the construction of these facilities associated with implementation of Alternative A would be a **less than significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

No special-status species were observed within the vicinity of the proposed construction footprint of the TRR or associated facilities. Therefore, construction, operation, and maintenance activities associated with these facilities resulting from implementation of Alternative A would be expected to have a **less-than-significant impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

After construction is complete, it is possible that larger areas of disturbance associated with these proposed facilities could interfere with the movement of small mammals, reptiles, or amphibians. However, all of the disturbance would occur in agricultural, urban/disturbed, or canal habitat. The surrounding area that includes these habitats would be preserved. These facilities would not be expected to substantially interfere with the movement of resident wildlife species because those species would be able to travel around the areas of disturbance. Therefore, construction, operation, and maintenance of these facilities associated with implementation of Alternative A would have a **less-than-significant impact** on wildlife movement, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Wildlife and wildlife habitats may be directly or indirectly affected by Project-related construction, operation, and maintenance of these facilities. Construction activities would include the use of heavy equipment, and would result in increased traffic from the transportation of personnel and materials, which could lead to increased mortality from vehicles and increased disturbance from noise and artificial lighting. Operation and maintenance would require vehicle access to these facilities, and may require nighttime safety lighting, which can adversely affect many wildlife species, especially nocturnal species. Pump operation could result in increased noise levels that may adversely affect wildlife. Therefore, the human disturbance associated with construction, operation, and maintenance of these facilities resulting from implementation of Alternative A would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-5** discussion for Sites Reservoir Inundation Area and Sites Reservoir Dams.

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Delevan Pipeline, Terminal Regulating Reservoir Pipeline, Terminal Regulating Reservoir Pipeline Road, and Delevan Pipeline Electrical Switchyard

The proposed TRR Pipeline would be aligned parallel and adjacent to the western 3.5 miles of the proposed Delevan Pipeline, and would be completely within the construction disturbance area of the Delevan Pipeline. The TRR Pipeline Road would be located atop the length of the TRR Pipeline, and the Delevan Pipeline Electrical Switchyard would be located where the Delevan Pipeline would cross the existing PG&E transmission line. The construction of the pipelines would require ground-disturbing activities that would result in the temporary disturbance of wildlife habitats that would be restored to their original habitat type after construction is complete. The construction of the TRR Pipeline Road and Delevan Pipeline Electrical Switchyard would require ground-disturbing activities that would result in permanent habitat loss (Table 14-15).

Table 14-15
Permanent Wildlife Habitat Loss and Temporary Disturbance Due to the Construction of the Delevan and Terminal Regulating Reservoir Pipelines, Terminal Regulating Reservoir Pipeline Road, and Delevan Pipeline Electrical Switchyard: Alternative A

Habitat	Temporary Disturbance (Acres)	Permanent Loss (Acres)
Barren*	20.9	0.2
Canal	8.2	0.1
Deciduous orchard	173.2	3.7
Dryland grain and seed crops	190.1	0.2
Eucalyptus	46.2	0
Fresh emergent wetland	18.5	0
Irrigated row and field crops	196.3	3.8
Lacustrine	5.1	0
Pasture	240.0	0
Rice	1,358.9	0.3
Urban/disturbed	36.8	0
TOTAL	2,294.2	8.3

*Barren habitat includes fallowed agricultural fields

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Barren

Barren habitat within the construction disturbance area of the proposed Delevan and TRR pipelines consists of fallowed agricultural fields. The only special-status species that has the potential to use this type of barren habitat is the wintering mountain plover. This species was not observed within any of the Project facility sites, but is known to occur in southeast Colusa County. Depending on the time of year and duration of construction activities, the temporary disturbance of 20.9 acres of barren habitat and permanent loss of 0.2 acre resulting from construction of the Delevan and TRR pipelines, TRR Pipeline Road, and Delevan Pipeline Electrical Switchyard associated with implementation of Alternative A would be a **potentially significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Canal

The canal habitat within the construction disturbance area of the proposed Delevan and TRR pipelines is represented by the locations where the Delevan Pipeline would cross the GCID Canal and the CBD. The special-status American white pelican and yellow warbler were observed at the CBD.

At the GCID Canal crossing location, construction would include tunneling below the canal without disturbing the existing infrastructure. Because no loss of canal habitat would occur as a result of pipeline construction associated with implementation of Alternative A, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

At the CBD crossing location, construction would occur after the irrigation season ends and before winter rains begin. Construction would be staged at this crossing and would occur within half of the channel while an installed cofferdam bypasses flows on the other half of the channel. The temporary disturbance of the CBD would be short-term, would affect a small area of the CBD, and would not disrupt upstream and downstream passage or use of adjacent areas. Therefore, pipeline construction associated with implementation of Alternative A would have a **less-than-significant impact** on the CBD, when compared to Existing Conditions and the No Project/No Action Alternative.

Deciduous Orchard

Deciduous orchard habitat within the construction disturbance area of the proposed Delevan and TRR pipelines consists of almond trees. The temporary disturbance of 173.2 acres and permanent loss of 3.7 acres of deciduous orchard habitat resulting from the construction of the Delevan and TRR pipelines, TRR Pipeline Road, and Delevan Pipeline Electrical Switchyard associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Dryland Grain and Seed Crops

Dryland grain and seed crops habitat within the construction disturbance area of the proposed Delevan and TRR pipelines has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams. The temporary disturbance of 190.1 acres and permanent loss of 0.2 acre of dryland grain and seed crops habitat resulting from the construction of the Delevan and TRR pipelines, TRR Pipeline Road, and Delevan Pipeline Electrical Switchyard associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Eucalyptus

The eucalyptus habitat within the construction disturbance area of the proposed Delevan and TRR pipelines is located along the sides of an unlined irrigation canal, and consequently functions in a capacity similar to riparian habitat for many wildlife species. Eucalyptus habitat provides roosts, perches, and nest sites for numerous bird species, including raptors. The temporary disturbance of 46.2 acres of Eucalyptus habitat resulting from the construction of the Delevan and TRR pipelines associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Fresh Emergent Wetland

The fresh emergent wetland habitat within the construction disturbance area of the proposed Delevan and TRR pipelines, which includes alkaline wetlands, has the potential to support numerous species of wildlife, including the special-status giant garter snake, sandhill crane, black tern, northern harrier, short-eared owl, tri-colored blackbird, white-tailed kite, and yellow-headed blackbird. All of these species were observed along the pipeline disturbance area in adjacent habitat types. The temporary disturbance of 18.5 acres of fresh emergent wetland habitat resulting from the construction of the Delevan and TRR pipelines associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Irrigated Row and Field Crops

Irrigated row and field crops habitat within the construction disturbance area of the proposed Delevan and TRR pipelines has the same value to wildlife as described in the impact assessment for the Holthouse Reservoir Complex. The temporary disturbance of 196.3 acres and permanent loss of 3.8 acres of irrigated row and field crops habitat resulting from the construction of the Delevan and TRR pipelines, TRR Pipeline Road, and Delevan Pipeline Electrical Switchyard associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Lacustrine

The lacustrine habitat within the construction disturbance area of the proposed Delevan and TRR pipelines represents a large pond, which has the same value to wildlife as described in the impact assessment for lacustrine habitat within the Recreation Areas. This pond is located in proximity to the fresh emergent wetlands of the adjacent Delevan NWR, and therefore, may provide habitat for numerous wildlife species. The temporary disturbance of 5.1 acres of lacustrine habitat resulting from pipeline construction activities associated with implementation of Alternative A would have a **potentially significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Pasture

Pasture habitat within the construction disturbance area of the proposed Delevan and TRR pipelines has the same habitat value to wildlife as described in the impact assessment for Sites Reservoir and Dams. The special-status golden eagle and prairie falcon were observed within this habitat type along the pipeline disturbance area. The temporary disturbance of 240.0 acres of pasture habitat resulting from pipeline construction activities associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Rice

Rice habitat within the construction disturbance area of the proposed Delevan and TRR pipelines has the same value to wildlife as described in the impact assessment for the TRR, TRR Pumping/Generating Plant, and GCID Canal Connection to the TRR. The special-status western pond turtle was observed along an irrigation canal associated with rice habitat. The black tern, long-billed curlew, Caspian tern, sandhill crane, long-eared owl, short-eared owl, white-tailed kite, and yellow-headed blackbird were observed in rice fields or adjacent habitats within this construction disturbance area. The temporary disturbance of 1,358.9 acres and permanent loss of 0.3 acre of rice habitat resulting from pipeline, road, and electrical switchyard construction activities associated with implementation of Alternative A would

be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Urban/Disturbed

The urban/disturbed habitat within the construction disturbance area of the proposed Delevan and TRR pipelines consists of roads and several structures. The structures would not be demolished, and the roads provide little habitat value for wildlife. Therefore, the permanent loss of 36.8 acres of urban/disturbed habitat resulting from pipeline construction activities associated with implementation of Alternative A would be a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Bank Swallow

Construction of the proposed Delevan and TRR pipelines would require the creation of trenches that would have steep cut banks made of sandy loam soils. Due to the proximity of the trench to the Sacramento River and to known breeding populations of bank swallows, the banks of the trenches could attract nesting bank swallows. Nesting bank swallows within the construction area would be at high risk of injury or death. Therefore, the construction of the pipelines associated with implementation of Alternative A could have a **potentially significant impact** on bank swallows, when compared to Existing Conditions and the No Project/No Action Alternative.

Giant Garter Snake

The USFWS confirmed that giant garter snakes use the rice fields and fresh emergent wetlands within the construction disturbance area of the proposed Delevan Pipeline. Giant garter snakes are also known to occur in the CBD, which could have construction-related impacts where the pipeline crosses the CBD. The pipeline would take approximately two years to build, and would be conducted outside of a November through April timeframe for protection of the giant garter snake. The pipeline would likely be constructed in sections, so that loss of habitat would occur in stages, rather than for the entire length of the pipeline all at once. Because dredged material from the underground footprint of the pipeline would potentially be spread over the entire width of the construction disturbance area, total loss of habitat would occur temporarily within the disturbance area. Fallowing of rice fields would not only temporarily remove giant garter snake habitat, but could also have adverse effects on the reproduction, recruitment, and survival of this species that could continue beyond the two-year construction schedule. The temporary loss of fresh emergent wetland habitat, as well as the extensive temporary loss of rice habitat resulting from construction activities associated with implementation of Alternative A, would have a **significant impact** on the giant garter snake, when compared to Existing Conditions and the No Project/No Action Alternative.

Western Pond Turtle

Construction of the proposed Delevan Pipeline could temporarily disturb existing canal habitat within the construction disturbance area. Western pond turtles were observed within the disturbance area along an irrigation canal. Although the area would be restored after construction is complete, construction activities could result in the direct mortality of this species. Therefore, construction of the Delevan

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Pipeline associated with implementation of Alternative A would have a **potentially significant impact** on western pond turtles, when compared to Existing Conditions and the No Project/No Action Alternative.

Western Yellow-Billed Cuckoo

Construction of the proposed Delevan and TRR pipelines, TRR Pipeline Road, and Delevan Pipeline Electrical Switchyard would temporarily disturb existing deciduous orchards within the construction disturbance area. The special-status western yellow-billed cuckoo uses deciduous orchards when the orchards are located near riverine and riparian habitat. However, the orchards within the construction disturbance area of these pipelines are located approximately 11 miles west of the Sacramento River, and therefore, do not represent suitable habitat for this species. Therefore, construction of the Delevan and TRR pipelines associated with implementation of Alternative A would have a **no impact** on western yellow-billed cuckoos, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Construction of the proposed pipelines would require an open trench. Exposed pipeline trenches could trap small mammals, amphibians, or reptiles moving through the area, including the special-status giant garter snake. Nocturnal wildlife would have a high risk of falling into the trenches. Wildlife could be injured during the fall into the trench, and once trapped would have no access to food, water, or shelter. Trapped wildlife would also be at risk of predation. The open trench associated with construction of the pipelines resulting from implementation of Alternative A would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Wildlife and wildlife habitats may be directly or indirectly affected by Project-related construction and maintenance of the proposed pipelines, road, and electrical switchyard. Construction activities would include the use of heavy equipment, and would result in increased traffic from the transportation of personnel and materials, which could lead to increased mortality from vehicles and increased disturbance from noise and artificial lighting. Operation and maintenance would require vehicle access to these facilities, and may require nighttime safety lighting, which can adversely affect many wildlife species, especially nocturnal species. Therefore, the human disturbance associated with construction and maintenance of the pipelines, road, and electrical switchyard resulting from implementation of Alternative A would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-5** discussion for Sites Reservoir Inundation Area and Sites Reservoir Dams.

Delevan Transmission Line

The Delevan Transmission Line would parallel, and be completely within the construction disturbance area of, the proposed Delevan Pipeline, with the exception of the westernmost 3.5 miles. Because the impacts of the eastern approximately nine miles of the proposed transmission line route construction

disturbance area are already accounted for in the impact assessment for the Delevan Pipeline, only the temporary ground disturbance of the remaining 3.5 miles of the transmission line are analyzed here. Disturbed habitats would be restored to their original habitat type after construction is complete. The construction disturbance area of the Delevan Transmission line would result in the temporary disturbance of wildlife habitats (Table 14-16).

Table 14-16
Temporary Disturbance of Wildlife Habitat from Construction of the Delevan Transmission Line:
Alternative A

Habitat	Number of Acres Affected for the Entire Length of the Transmission Line	Number of Acres Affected for the Section of the Transmission Line Outside of the Delevan Pipeline Construction Disturbance Area
Annual grassland	69.5	69.5
Barren*	0.5	0.5
Canal	1.5	1.2
Dryland grain and seed crops	25.6	1.5
Deciduous orchard	0.4	0
Eucalyptus	0.3	0
Fresh emergent wetland	2.1	0
Irrigated row and field crops	9.4	0
Lacustrine	1.0	0
Pasture	24.5	0
Rice	143.0	0
Urban/disturbed	1.1	0
Valley foothill riparian	1.1	1.1
TOTAL	280.0	73.8

*Barren habitat includes fallowed agricultural fields.

Although the proposed transmission line would be an above-ground feature and have no associated permanent ground disturbance, the footings of the transmission towers would result in the permanent loss of wildlife habitat. Based on a worst-case scenario, the total permanent habitat loss associated with the footings would be approximately 2.5 acres of a combination of rice and annual grassland habitat.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Annual Grassland

Annual grassland within the construction disturbance area of the proposed Delevan Transmission Line has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams. The temporary disturbance of 69.5 acres and the potential permanent loss of up to 2.5 acres of annual grassland habitat, resulting from the construction of the transmission line associated with implementation of Alternative A, would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Barren

Barren habitat within the construction disturbance area of the proposed Delevan Transmission Line consists of fallowed agricultural fields. During Project construction, additional agricultural fields would be temporarily fallowed. The only special-status species that has the potential to use this type of barren habitat is the wintering mountain plover. This species was not observed within any of the Project facility sites, but is known to occur in southeast Colusa County. Depending on the time of year and duration of construction activities, the temporary disturbance of 0.5 acre of barren habitat resulting from construction of the Delevan Transmission Line associated with implementation of Alternative A would be a **potentially significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Canal

The canal habitat within the construction disturbance area of the proposed Delevan Transmission Line is represented by the location where the construction disturbance area crosses the T-C Canal. The transmission line would be aligned above and across the canal, but would not disturb existing infrastructure. Because no loss of canal habitat or disturbance of the main channel would occur as a result of transmission line construction associated with implementation of Alternative A, there would be **no impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Dryland Grain and Seed Crops

Dryland grain and seed crops within the construction disturbance area of the proposed Delevan Transmission Line have the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams. The temporary disturbance of 1.5 acres of dryland grain and seed crops resulting from the construction of the transmission line associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Valley Foothill Riparian

Valley foothill riparian habitat within the construction disturbance area of the proposed Delevan Transmission Line has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams, with the exception of elderberry shrubs, which are not present within the disturbance area. The temporary disturbance of 1.1 acres of valley foothill riparian habitat resulting from the construction of the Delevan Transmission Line associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

No special-status species were observed within the vicinity of the construction disturbance area for the proposed Delevan Transmission Line, and on-the-ground disturbance would be limited to tower footings. Therefore, construction activities associated with these facilities resulting from implementation of Alternative A would be expected to have a **less-than-significant impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Transmission lines can provide perch sites for birds, but the length of the transmission line that would be aligned from the Sacramento River to the proposed Sites Electrical Switchyard also has the potential to create conflicts with birds. Raptors and other birds may collide with the conductors (i.e., wires) on the transmission line towers during their construction and operation; however, the construction activities associated with the towers are not expected to interfere with bird movement. The eastern end of the transmission line would be located adjacent to the Delevan NWR, and could, therefore, disrupt a migratory corridor by causing collisions. The potential disruption of a migratory corridor, as well as the increased risk of collisions resulting from the construction and operation of the Delevan Transmission Line associated with implementation of Alternative A would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Wildlife and wildlife habitats may be directly or indirectly affected by Project-related construction, operation, and maintenance of the proposed transmission lines. Construction activities would include the use of heavy equipment, and would result in increased traffic from the transportation of personnel and materials, which could lead to increased mortality from vehicles and increased disturbance from noise and artificial lighting. Operation and maintenance would require vehicle access to these facilities, and may require nighttime safety lighting, which can adversely affect many wildlife species, especially nocturnal species. Transmission line towers are often used by nesting osprey and other raptors. If an osprey nest were established, maintenance activities could disturb this species during incubation or before young have fledged. Therefore, the human disturbance associated with construction, operation, and maintenance of the transmission line resulting from implementation of Alternative A would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-5** discussion for Sites Reservoir Inundation Area and Sites Reservoir Dams.

Delevan Pipeline Intake Facilities

Construction activities associated with the proposed Delevan Pipeline Intake Facilities, which includes a fish screen and pumping/generating facility located on the Sacramento River, would result in the direct and permanent loss of wildlife habitats (Table 14-17).

Additional acreage of temporary disturbance would occur as a result of a construction disturbance area for these proposed facilities. The construction disturbance area for the Delevan Pipeline is located adjacent to these facilities and could potentially be used as a staging area. Disturbed areas would be restored to their original habitat type after construction is complete. The wildlife habitat that would be most affected by this construction disturbance area would be deciduous orchard habitat.

Table 14-17
Permanent Wildlife Habitat Loss Due to the Construction of the Delevan Pipeline Intake Facilities:
Alternative A

Habitat	Permanent Loss (Acres)
Canal	0.6
Deciduous orchard	11.1
Riverine	1.6
Urban/disturbed	4.2
Valley foothill riparian	1.6
TOTAL	19.1

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Canal

Canal habitat within the footprint of the proposed Delevan Pipeline Intake Facilities consists of a small irrigation canal, and has the same value to wildlife as described in the impact assessment for Holthouse Reservoir and Dam. The permanent loss of 0.6 acre of canal habitat resulting from construction activities associated with implementation of Alternative A would be a **less-than-significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Deciduous Orchard

Deciduous orchard habitat within the footprint of the proposed intake facilities, which consists of walnut orchards, is located immediately adjacent to the Sacramento River. Deciduous orchards with a riverine/riparian edge are used by numerous wildlife species, including the special-status western yellow-billed cuckoo. The permanent loss of 11.1 acres of deciduous orchard habitat resulting from the construction of the Delevan Pipeline Intake Facilities associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Riverine

Riverine habitat within the footprint of the proposed Delevan Pipeline Intake Facilities consists of a portion of the Sacramento River. The construction disturbance area would be located immediately downstream of the existing Maxwell Irrigation District (ID) Pumping Plant. The Sacramento River supports numerous wildlife species, including the special-status bank swallow, American white pelican, and bald eagle. The permanent loss of 1.6 acres of riverine habitat associated with construction of the Delevan Pipeline Intake Facilities resulting from implementation of Alternative A would have a **potentially significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Urban/Disturbed

The urban/disturbed habitat within the footprint of the proposed Delevan Pipeline Intake Facilities consists of small maintenance buildings and associated access roads. Construction of the intake facilities

would require the demolition of the maintenance buildings, which could provide roosting habitat for bats. Therefore, the permanent loss of 4.2 acres of urban/disturbed habitat resulting from the construction of the Delevan Pipeline Intake Facilities associated with implementation of Alternative A would be a **potentially significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Valley Foothill Riparian

Valley foothill riparian habitat within the footprint of the proposed Delevan Pipeline Intake Facilities has the same value to wildlife as described in the impact assessment for Sites Reservoir and Dams. There is one elderberry shrub within the construction footprint and a second elderberry shrub adjacent to the footprint. The State fully-protected ringtail was observed using this habitat within the footprint of the intake facilities. This riparian habitat has the potential to support the special-status western yellow-billed cuckoo, Swainson's hawk, western pond turtle, long-eared owl, and the yellow warbler. The permanent loss of 1.6 acres of valley foothill riparian habitat resulting from the construction of the Delevan Pipeline Intake facilities associated with implementation of Alternative A would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Bank Swallow

Construction of the proposed Delevan Pipeline Intake Facilities would result in the loss of approximately 660 linear feet (0.1 mile) of river bank. This section of the bank supports riparian habitat. There are no steep barren banks that are suitable for bank swallow excavation. Bank swallow colonies have been documented near this location in previous years, but the lack of barren habitat and the geologic control in this section of the river makes it unsuitable for excavation, and therefore, unsuitable nesting habitat, for the bank swallow. Therefore, the habitat loss associated with the construction of the Delevan Pipeline Intake Facilities resulting from implementation of Alternative A would have **no impact** on bank swallows, when compared to Existing Conditions and the No Project/No Action Alternative.

Ringtail

The State fully-protected ringtail was observed within the riparian habitat that would be removed during construction of the proposed Delevan Pipeline Intake Facilities. The loss of 1.6 acres and 660 linear feet of this habitat type would further reduce the connectivity of the riparian corridor at this location, which could reduce the value of the adjacent riparian habitat to the ringtail. The loss of 1.6 acres of riparian habitat resulting from the construction of the Delevan Pipeline Intake Facilities associated with implementation of Alternative A would be a **potentially significant impact** to the ringtail, when compared to Existing Conditions and the No Project/No Action Alternative.

Operation and maintenance activities would occur within the footprint of the facilities and would not further disrupt habitat connectivity. However, noise and night-time lighting associated with these activities could affect habitat quality for the ringtail and would have a **potentially significant impact**.

Valley Elderberry Longhorn Beetle

One elderberry shrub exists within the riparian habitat that would be displaced as a result of construction of the proposed Delevan Pipeline Intake Facilities. Protocol-level surveys were conducted on this elderberry shrub, and no emergence holes were found. A second elderberry shrub is located adjacent to the footprint of the proposed facility, within an orchard on the edge of an irrigation canal that is aligned parallel to an access road. This road may be used during construction, operation, and maintenance activities; consequently, the shrub could be adversely affected. This second elderberry shrub has not been surveyed.

Although no emergence holes were found on the surveyed shrub, the loss of this elderberry shrub and the possible disturbance of a second shrub during construction associated with implementation of Alternative A would be a **significant impact** to the valley elderberry longhorn beetle, when compared to Existing Conditions and the No Project/No Action Alternative.

Western Yellow-Billed Cuckoo

The 1.6 acres of riparian habitat that would be lost as a result of construction of the proposed Delevan Pipeline Intake Facilities are located immediately adjacent to walnut orchards, of which 11.2 acres would be lost. Both of these habitat types are used by the western yellow-billed cuckoo along the Sacramento River. During a 2010 survey, cuckoos were detected along the river 4.5 miles upstream and 1.5 miles downstream of the footprint of the proposed Intake Facility. It is possible that the habitat within the construction footprint is also used by this species, although it was not detected during Project surveys or during the 2010 survey at this location. The loss of riparian and deciduous orchard habitat along the Sacramento River resulting from construction of the Delevan Pipeline Intake Facilities associated with implementation of Alternative A would be a **potentially significant impact** to the western yellow-billed cuckoo, when compared to Existing Conditions and the No Project/No Action Alternative.

Maintenance activities would occur within the footprint of the facilities and would not be expected to adversely affect the surrounding riparian or orchard habitat. Noise levels associated with maintenance activities, such as sediment removal, are expected to be similar to the levels associated with the proposed pumps, as well as the existing Maxwell ID pumps, and would not be expected to substantially adversely affect this species. Therefore, maintenance activities associated with these facilities would have a **less-than-significant impact** on the western yellow-billed cuckoo.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

The valley foothill riparian habitat that exists along the banks of the Sacramento River provides a travel corridor for numerous terrestrial wildlife species, including the fully-protected ringtail. Gaps in the connectivity of this corridor create higher risks of predation for wildlife that travel through these areas. Therefore, the removal of 660 linear feet of valley foothill riparian habitat along the Sacramento River associated with construction of the proposed Delevan Pipeline Intake Facilities resulting from implementation of Alternative A would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Operation and maintenance activities would not be expected to result in additional ground disturbance or placement of facilities, and therefore, would have a **less-than-significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Refer to the **Impact Wild-2** discussion for the potential impact of noise and night-time lighting on the ringtail.

Wildlife and wildlife habitats may be directly or indirectly affected by Project-related construction, operation, and maintenance of the intake facilities. Construction activities would include sheet pile driving and the use of heavy equipment, and would result in increased traffic from the transportation of personnel and materials. These activities could lead to increased mortality from vehicles and increased disturbance from noise and artificial lighting. Operation and maintenance would require vehicle access to these facilities, and may require nighttime safety lighting, which can adversely affect many wildlife species, especially nocturnal species. Pump operation could result in increased noise levels that may adversely affect wildlife. Therefore, the human disturbance associated with construction, operation, and maintenance of these facilities resulting from implementation of Alternative A would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-5** discussion for Sites Reservoir Inundation Area and Sites Reservoir Dams.

Project Buffer

Within the Proposed Take Line, the following activities are expected to occur: fence construction, the demolition of existing structures, and fuelbreak maintenance. The acreage of wildlife habitats included within the Proposed Take Line buffer is presented in Table 14-18.

**Table 14-18
Acres of Wildlife Habitat Within the Project Buffer^a: Alternative A**

Habitat	Acres within Project Buffer
Annual grassland	8,083.1
Barren ^b	2.9
Blue oak woodland	4,180.1
Canal	15.8
Chamise-redshank chaparral	1.9
Deciduous orchard	77.8
Dryland grain and seed crops	134.3
Irrigated row and field crops	151.2
Lacustrine	17.2
Pasture	15.7
Rice	21.1
Riverine	0.1

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Table 14-18
Acres of Wildlife Habitat Within the Project Buffer^a: Alternative A

Habitat	Acres within Project Buffer
Urban/disturbed	35.4
Valley foothill riparian	63.4
TOTAL	12,800.0

^aCalculated by subtracting the acreage of permanent disturbance associated with each proposed Project facility that is surrounded by the Project Buffer, the acreage of existing Funks Reservoir, and the acreage of the portion of the existing GCID Canal that is surrounded by the Project Buffer, from the total acreage of land that would be acquired for the Project.

^bBarren includes fallow/idle agricultural fields.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Annual Grassland, Barren, Blue Oak Woodland, Canal, Chamise-Redshank Chaparral, Lacustrine, and Valley Foothill Riparian

The above-listed wildlife habitat types within the Project Buffer have the same value to wildlife as described for other Project features, and would not be altered or converted to other habitat types. Construction and maintenance activities associated with fence building would have a negligible impact on these habitat types because the footprint of the fence posts would be small and a large portion of the Project Buffer is already fenced. However, the potential creation and maintenance of a fuelbreak would require vegetation clearing that, if maintained around the entire perimeter of the Project Buffer, could result in a substantial adverse effect due to the loss of wildlife habitat. Therefore, the potential loss of wildlife habitat associated with construction and maintenance of the Project Buffer fuelbreak resulting from implementation of Alternative A would be a **potentially significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Deciduous Orchard, Dryland Grain and Seed Crops, Irrigated Row and Field Crops, Pasture, and Rice

The above-listed agricultural habitat types within the Project Buffer have the same value to wildlife as described for other Project features, but would not be maintained as agricultural lands after Project construction is complete. These agricultural lands would be converted to natural wildlife habitat, likely to annual grassland habitat. Although some wildlife species would benefit from this conversion, other wildlife species may be adversely affected. Therefore, the loss of 211.4 acres of agricultural habitat types that would be converted to natural habitat types within the Project Buffer as a result of implementation of Alternative A would be a **potentially significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Urban/Disturbed

The urban/disturbed habitat within the Project Buffer consists of roads and structures. Construction activities within the Project Buffer would include the demolition of existing structures that may provide roosting habitat for bats. After demolition activities cease, the urban/disturbed habitat would be converted to natural wildlife habitat, likely to annual grassland habitat. This habitat conversion may benefit several wildlife species. However, potential loss of bat roosting habitat associated with the demolition of structures within the Project Buffer resulting from implementation of Alternative A would be a

potentially significant impact, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Activities associated with fence construction and maintenance could result in the temporary disturbance of special-status wildlife species. Demolition of existing structures during construction has the potential to result in the loss of roosting habitat for special-status bats. The creation of a fuelbreak would result in the loss of habitat that may be used by special-status wildlife species, and maintenance of the fuelbreak could disturb those species. Therefore, construction and maintenance activities that would occur within the Project Buffer would have a **potentially significant impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

The potential construction of barbed wire fencing around the perimeter of the Project Buffer in the few areas where fencing does not already occur would not be expected to interfere with wildlife movement. Fencing already occurs around most, if not all, of the property lines, and the fence design would allow wildlife to go under, through, or over the fencing. Periodic fence maintenance would not be expected to interfere with wildlife movement. The construction and maintenance of a fuelbreak would eliminate vegetative cover within the footprint of the fuelbreak, but would not be expected to substantially interfere with wildlife movement. Therefore, the construction and maintenance of fencing and the fuelbreak within the Project Buffer associated with implementation of Alternative A would have a **less-than-significant impact** on wildlife movement, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-4: Indirect Effects on Common Wildlife from Human Disturbance

Although signs would be posted to prevent recreationists from using the Project Buffer lands, it is likely that unauthorized hiking, biking, or other recreational activity would occur within the take line. In addition, the construction crews required to demolish existing structures or build fences would cause a temporary disturbance to wildlife. Maintenance activities associated with fencing and the fuelbreak could also disturb wildlife. Therefore, human disturbance associated with Project Buffer activities would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-5: Conflict with the Provisions of an Adopted HCP, NCCP, or Other Approved Local or Regional HCP, or Conflict with any Local Policies or Ordinances Protecting Biological Resources, such as a Tree Preservation Policy or Ordinance

Refer to the **Impact Wild-5** discussion for Sites Reservoir Inundation Area and Sites Reservoir Dams.

Summary of Alternative A Impacts to Wildlife Habitats

Construction, operation, and maintenance of Alternative A would result in the permanent loss of 13,572.6 acres, and the temporary disturbance of an additional 5,357.9 acres of wildlife habitat (Table 14-19).

Table 14-19
Acres of Wildlife Habitat Subject to Alternative A Construction Impacts^a

Habitat Type	Acreage	
	Permanent Loss ^b	Temporary Disturbance ^c
Annual grassland	12,151.8	2,091.4
Barren	0.2	21.4
Blue oak woodland	501.4	644.5
Canal	9.1	14.1
Chamise-redshank chaparral	0.6	1.9
Deciduous orchard	15.4	175.1
Dryland grain and seed crops	333.2	214.5
Eucalyptus	0	46.2
Fresh emergent wetland ^d	0.5	18.5
Irrigated row and field crops	155.6	225.7
Lacustrine	20.8	2,264.0
Mixed chaparral	0.8	1.8
Pasture	72.7	241.2
Rice	122.9	1,383.6
Riverine	1.6	0
Urban/disturbed	88.1	46.9
Valley foothill riparian	94.5	4.7
Valley oak woodland	3.4	0
TOTAL	13,572.6	5,357.9

^aCalculated acreage does not include acres associated with the Project Buffer because the location and extent of disturbance is not yet specified.

^bTotal permanent wildlife habitat loss acreage includes the defined footprints of Sites Reservoir and Dams, Sites Reservoir Inlet/Outlet Structure, Sites Pumping/Generating Plant, Sites Electrical Switchyard, Field Office Maintenance Yard, Holthouse Reservoir Complex, Holthouse Reservoir Electrical Switchyard, GCID Canal Connection to the TRR, TRR, TRR Pumping/Generating Plant, TRR Electrical Switchyard, TRR Pipeline Road, Delevan Pipeline Electrical Switchyard, and the Delevan Pipeline Intake Facilities. Total permanent loss acreage also includes the estimated permanent loss from construction of facilities within the footprint of the Recreation Areas, within the construction disturbance area for the Road Relocations, and from construction of the transmission tower footings associated with the Delevan Transmission Line.

^cTotal temporary disturbance acreage includes the footprint of the Recreation Areas (minus the acreage of estimated permanent loss) and the footprint of the existing Funks Reservoir, as well as the defined construction disturbance areas for the Road Relocations and South Bridge (minus the acreage of estimated permanent loss), Delevan Pipeline, TRR Pipeline, Holthouse to T-C Canal Pipeline, TRR to Funks Creek Pipeline, Delevan Transmission Line, and GCID Canal Facilities Modifications. Total temporary disturbance acreage also includes the estimated construction disturbance areas (outside of the facility footprints) for Sites Reservoir and Dams, Sites Reservoir Inlet/Outlet Structure, Sites Pumping/Generating Plant, Tunnel from Sites Pumping Generating Plant to Sites Inlet/Outlet Structure, Sites Electrical Switchyard, Field Office Maintenance Yard, Holthouse Reservoir Complex, Holthouse Reservoir Electrical Switchyard, GCID Canal Connection to the TRR, TRR, TRR Pumping/Generating Plant, TRR Electrical Switchyard, and Delevan Pipeline Intake Facilities.

^dFresh Emergent Wetland includes alkaline wetlands.

14.3.7 Impacts Associated with Alternative B

14.3.7.1 Extended Study Area – Alternative B

Construction, Operation, and Maintenance Impacts

The impacts associated with Alternative B, as they relate to wildlife habitat (**Impact Wild-1**), special-status wildlife species (**Impact Wild-2**), and wildlife movement (**Impact Wild-3**), as well as the

potential impacts from human disturbance (**Impact Wild-4**), or conflicts with habitat plans (**Impact Wild-5**), would be the same as described for Alternative A for the Extended Study Area.

14.3.7.2 Secondary Study Area – Alternative B

Construction, Operation, and Maintenance Impacts

The impacts associated with Alternative B operations on wildlife habitat (**Impact Wild-1**), special-status wildlife species (**Impact Wild-2**), and wildlife movement (**Impact Wild-3**), as well as the potential impacts from human disturbance (**Impact Wild-4**), or conflicts with habitat plans (**Impact Wild-5**) would be the same as described for Alternative A for Lewiston Lake, Whiskeytown Lake, Keswick Reservoir, Lake Natoma, Thermalito Complex, Trinity River, Klamath River, Spring Creek, Clear Creek, Feather River, American River, Sacramento-San Joaquin Delta, Suisun Bay, San Pablo Bay, San Francisco Bay, and for the Sacramento River as it pertains to the construction, operation, and maintenance impacts associated with the pump installation at the Red Bluff Pumping Plant.

For the remaining facilities, the indirect impacts to native plants from human disturbance (**Impact Wild-4**) and conflicts with conservation plans (**Impact Wild-5**) would also be the same as described for Alternative A.

Operational differences for Alternative B, when compared to Alternative A for Trinity Lake, Shasta Lake, Lake Oroville, Folsom Lake, the Sacramento River, Sutter Bypass, and Yolo Bypass, are discussed below.

Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake

Operational modeling results for Alternative B, when compared to Existing Conditions and the No Project/No Action Alternative, are similar to those described for Alternative A as Alternative B would also result in improved storage conditions. However, Alternative B operations would result in more variable reservoir surface water elevation fluctuations than Alternative A.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

With implementation of Alternative B, these reservoirs would experience more variability in surface water elevation fluctuations, when compared to Alternative A. However, these fluctuations would still be less severe than when compared to Existing Conditions or the No Project/No Action Alternative. Therefore, operational changes at Trinity Lake, Shasta Lake, Lake Oroville, and Folsom Lake associated with implementation of Alternative B that would result in improved storage and reduced water level fluctuations would have a **beneficial effect** on wildlife habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Refer to the **Impact Wild-1** discussion. That discussion is also applicable to special-status wildlife species.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-1** discussion. That discussion is also applicable to interference with wildlife movement.

Sacramento River

Operational modeling indicates that Sacramento River flows associated with implementation of Alternative B would experience changes similar to those described for Alternative A. However, Alternative B would divert up to 3,900 cfs during winter flows (rather than the 5,900 cfs diversion that would occur with Alternative A during winter flows). The reduced rate of diversion would consequently require a longer duration of diversion, lasting from February through May.

Modeling performed using SRH-1DV and SacEFT indicates that the coverage of the valley foothill riparian vegetation alliance along the Sacramento River would increase or remain similar with implementation of Alternative B, when compared to Existing Conditions and the No Project/No Action Alternative. The only exception is that SacEFT indicates a slight increase in the number of years with post-initiation scour risk for Fremont Cottonwood seedlings with implementation of Alternative B, when compared to the No Project/No Action Alternative. For bank swallows, SacEFT modeling indicates negligible effects that would result from peak flow during nesting season and a slight decrease in habitat potential and suitability with implementation of Alternative B, when compared to the Existing Conditions and the No Project/No Action Alternative. The decrease in habitat potential and suitability resulting from implementation of Alternative B would be slightly greater than the decrease resulting from implementation of Alternative A.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Despite the change in the rate and duration of diversion, operational modeling for Alternative B, including modeling that is specific to riparian habitat, indicates that minimal effects would occur to riparian habitat resulting from the described changes in the flow regime. Therefore, riparian habitat downstream of the intakes would not be expected to be adversely affected. Modifications of the existing flow regime of the Sacramento River resulting from implementation of Alternative B would have a **less-than-significant impact** on riparian habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Despite the change in the rate and duration of diversion, operational modeling for Alternative B, including modeling that is specific to riparian habitat, indicates that minimal effects would occur to riparian habitat resulting from the described changes in the flow regime. Therefore, riparian habitat downstream of the intakes would not be expected to be adversely affected, nor would the special-status birds or mammals associated with riparian habitat. SacEFT modeling specific to the bank swallow also indicates that there would be minimal effects to this species. Therefore, modifications of the existing flow regime of the Sacramento River resulting from implementation of Alternative B would have a

less-than-significant impact on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Sutter Bypass

Implementation of Alternative B would divert up to 3,900 cfs during winter flows; in comparison, Alternative A would result in the diversion of up to 5,900 cfs during winter flows. The reduced rate of diversion would require a longer duration of diversion.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Alternative B, when compared to Alternative A, would reduce the velocity and volume of floodwaters entering the Bypass from the Sacramento River, but diversions would be reduced by 2,000 cfs. Although the rate of diversion would be reduced, the duration of diversion would be longer, and therefore, could result in a greater reduction of water volume than described for Alternative A. This reduction in the frequency, velocity, and volume of water entering the Bypass would have the same effects on riparian and wetland habitats as described for Alternative A. Therefore, the relatively minor modification of the existing flow regime of the Sutter Bypass associated with implementation of Alternative B that would result in reduced magnitude and duration of floodwaters entering the Bypass would have a **less-than-significant impact** on riparian and wetland habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Alternative B's reduction in the frequency, velocity, and volume of water entering the Bypass would have the same effects on wildlife species as described for Alternative A. Therefore, the relatively minor modification of the existing flow regime of the Sutter Bypass associated with implementation of Alternative B that would result in reduced magnitude and duration of floodwaters entering the Bypass would be a **potentially beneficial effect** to special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild Impact-3** discussion for Alternative A. The relatively minor change in the flow regime with implementation of Alternative B would have a **less-than-significant impact** on wildlife nursery sites, when compared to Existing Conditions and the No Project/No Action Alternative.

Yolo Bypass

Operational modeling for Alternative B indicates that there would be a minor reduction in the duration and magnitude of flows entering into the Yolo Bypass.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

The relatively minor reduction in the frequency, velocity, and volume of water entering the Bypass associated with implementation of Alternative B would have the same effects on riparian and wetland habitats as described for Alternative A. The modification of the existing flow regime of the Yolo Bypass associated with implementation of Alternative B that would result in minor reductions in the frequency, velocity, and volume of floodwaters entering the Bypass would, therefore, have a **less-than-significant impact** on riparian and wetland habitat, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The relatively minor reduction in the velocity and volume of water entering the Bypass associated with implementation of Alternative B would have the same effects on riparian and wetland habitats as described for Alternative A, and would, therefore, not adversely affect the associated species. The minor modification of the existing flow regime of the Yolo Bypass associated with implementation of Alternative B that would result in the reduced frequency, velocity, and volume of floodwaters entering the Bypass, would, therefore, have a **less-than-significant impact** on special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. The minor modification of the existing flow regime of the Yolo Bypass that would result in the reduced frequency, velocity, and volume of floodwaters entering the Bypass as a result of implementing Alternative B would have a **less-than-significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

14.3.7.3 Primary Study Area – Alternative B

Construction, Operation, and Maintenance Impacts

The following Project facilities are included in both Alternatives A and B. These facilities would require the same construction methods and operation and maintenance activities regardless of alternative, and would, therefore, result in the same construction, operation, and maintenance impacts to terrestrial biological resources:

- Recreation Areas
- Sites Pumping/Generating Plant
- Sites Electrical Switchyard
- Tunnel from Sites Pumping/Generating Plant to Sites Reservoir Inlet/Outlet Structure

- Sites Reservoir Inlet/Outlet Structure
- Field Office Maintenance Yard
- Holthouse Reservoir Complex
- Holthouse Reservoir Electrical Switchyard
- GCID Canal Facilities Modifications
- GCID Canal Connection to the TRR
- TRR
- TRR Pumping/Generating Plant
- TRR Electrical Switchyard
- TRR Pipeline
- TRR Pipeline Road
- Delevan Pipeline
- Delevan Pipeline Electrical Switchyard

Although the footprint of the Recreation Areas would be the same for Alternatives A and B, the associated electrical distribution line alignment would differ as a result of the change in location of Golden Gate Dam. With implementation of Alternative B, 2.9 fewer acres of annual grassland would be affected by the Recreation Area Electrical Distribution Line construction disturbance area. However, these differences in the size of the facility footprint, alignment, or construction disturbance area would not change the type of construction, operation, and maintenance activities that were described for Alternative A. They would, therefore, have the same impact on wildlife habitat (**Impact Wild-1**), special-status wildlife species (**Impact Wild-2**), and wildlife movement (**Impact Wild-3**), as well as the potential impacts from human disturbance (**Impact Wild-4**), or conflicts with habitat plans (**Impact Wild-5**) as described for Alternative A.

In addition, the road relocations associated with Alternative B differ from those for Alternative A, mostly due to changes to the saddle dam access roads. An additional 2.5 acres of wildlife habitats would be affected by Alternative B roads. However, these differences in the size of the facility footprint, alignment, or construction disturbance area would not change the type of construction, operation, and maintenance activities that were described for Alternative A. They would, therefore, have the same impact on wildlife habitat (**Impact Wild-1**), special-status wildlife species (**Impact Wild-2**), and wildlife movement (**Impact Wild-3**), as well as the potential impacts from human disturbance (**Impact Wild-4**), or conflicts with habitat plans (**Impact Wild-5**) as described for Alternative A.

The boundary of the Project Buffer would be the same for Alternatives A and B, but because the footprints of some of the Project facilities that are included in the Project Buffer would differ between the alternatives, the acreage of land within the Project Buffer would also differ. However, these differences in the size of the area included in the Project Buffer would not change the type of construction, operation, and maintenance activities that were described for Alternative A. They would, therefore, have the same impact on wildlife habitat (**Impact Wild-1**), special-status wildlife species (**Impact Wild-2**), and wildlife movement (**Impact Wild-3**), as well as the potential impacts from human disturbance (**Impact Wild-4**), or conflicts with habitat plans (**Impact Wild-5**) as described for Alternative A.

For the remaining facilities, the effects of human disturbance on wildlife (**Impact Wild-4**) and conflicts with habitat plans (**Impact Wild-5**) would also be the same as described for Alternative A. However, for Alternative B, the footprint and/or construction disturbance area of Sites Reservoir and Dams, the Delevan Transmission Line, and the Delevan Discharge Facilities differ from Alternative A. These

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changes would affect different acreages of wildlife habitat. The differences between these facilities and their impacts on terrestrial biological resources are described below.

Sites Reservoir Inundation Area and Sites Reservoir Dams

Alternative B includes the construction of a 1.81-MAF Sites Reservoir, which requires the construction of Sites Dam, Golden Gate Dam, and nine saddle dams. For Alternative B, Sites Dam would have a larger footprint and Golden Gate Dam shifts location, when compared to Alternative A. Construction-related ground-disturbing activities and vegetation removal, and the subsequent filling of the reservoir, would result in the direct and permanent loss of the same wildlife habitats as described in Alternative A, but more acreage would be lost with the construction and filling of the larger reservoir (Table 14-20).

**Table 14-20
Permanent Wildlife Habitat Loss Due to the Construction and Filling of the 1.81-MAF Sites Reservoir and Associated Dams: Alternative B Compared to Alternative A**

Habitat	Permanent Loss (Acres) Alternative A	Permanent Loss (Acres) Alternative B	Additional Loss Associated with Alternative B when Compared to Alternative A
Annual grassland	11,654.6	13,196.9	1,542.3
Blue oak woodland	353.5	739.7	386.2
Dryland grain and seed crops	206.9	206.9	0
Lacustrine	20.2	21.8	1.6
Pasture	61.0	61.0	0
Urban/disturbed	76.1	78.8	2.7
Valley foothill riparian	81.5	97.5	16.0
Valley oak woodland	3.4	3.5	0.1
TOTAL	12,457.2	14,406.1	1,948.9

The construction disturbance area for the 1.81-MAF Sites Reservoir would be the same as described for the 1.27-MAF Sites Reservoir. The construction disturbance area could disturb as much as 1,000 acres of land, with the majority of disturbed habitat consisting of annual grassland habitat.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

Construction of the Alternative B reservoir and dams would result in the additional permanent loss of nearly 1,950 acres of wildlife habitat, when compared to Alternative A. The two habitat types most affected by the increased acreage would be annual grassland and blue oak woodland. The permanent loss and temporary disturbance of wildlife habitat resulting from the construction activities and filling of the reservoir associated with implementation of Alternative B would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The impacts of Alternative B on special-status wildlife species would be the same as described for Alternative A, with the exception of the impact on bald eagles. Construction of the larger Alternative B Golden Gate Dam would result in the direct take of an established bald eagle nest and nest tree because the tree is located within the proposed footprint of the dam. The disturbance or removal of this nest tree during the nesting season could result in the direct mortality of eggs or young, and the permanent loss of this nest tree would be a **significant impact** to bald eagles, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

Refer to the **Impact Wild-2** discussion. That discussion is also applicable to interference with wildlife movement.

Delevan Transmission Line

The design of the Delevan Transmission Line associated with Alternative B differs from that of Alternative A. Because there would be no pumping/generating plant associated with the Delevan Pipeline Discharge Facility, there would be no transmission line aligned from the Sacramento River to the existing PG&E or WAPA transmission line. There would, however, still be a transmission line aligned approximately three miles from the Sites Electrical Switchyard to the existing PG&E or WAPA transmission line. The construction disturbance area of the Delevan Transmission Line for Alternative B would result in the temporary disturbance of wildlife habitats, but at a much smaller scale than described for Alternative A (Table 14-21).

**Table 14-21
Temporary Disturbance of Wildlife Habitat Due to the Construction of the Delevan Transmission Line: Alternative B Compared to Alternative A**

Habitat	Temporary Disturbance (Acres) for the Entire Length of the Delevan Transmission Line for Alternative A	Temporary Disturbance (Acres) for the Section of the Alternative A Transmission Line outside of the Construction Disturbance area of the Delevan Pipeline	Temporary Disturbance (Acres) for the Entire Length of the Delevan Transmission Line for Alternative B
Annual grassland	69.5	69.5	54.6
Barren*	0.5	0.5	0
Canal	1.5	1.2	0.6
Dryland grain and seed crops	25.6	1.5	0
Deciduous orchard	0.4	0	0
Eucalyptus	0.3	0	0
Fresh emergent wetland	2.1	0	0
Irrigated row and field crops	9.4	0	0
Lacustrine	1.0	0	0

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Table 14-21
Temporary Disturbance of Wildlife Habitat Due to the Construction of the Delevan Transmission Line: Alternative B Compared to Alternative A

Habitat	Temporary Disturbance (Acres) for the Entire Length of the Delevan Transmission Line for Alternative A	Temporary Disturbance (Acres) for the Section of the Alternative A Transmission Line outside of the Construction Disturbance area of the Delevan Pipeline	Temporary Disturbance (Acres) for the Entire Length of the Delevan Transmission Line for Alternative B
Pasture	24.5	0	0
Rice	143.0	0	0
Urban/disturbed	1.1	0	0
Valley foothill riparian	1.1	1.1	1.1
TOTAL	280.0	73.8	56.3

*Barren habitat includes fallowed agricultural fields.

The footings of the transmission towers would result in the permanent loss of wildlife habitat. Based on a worst-case scenario, the total permanent habitat loss associated with the footings would be approximately 0.5 acre of annual grassland habitat, which is less than the 2.5-acre loss associated with Alternative A.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

The reduced length of the Alternative B Delevan Transmission Line would result in the temporary disturbance of approximately 17 fewer acres of wildlife habitat than Alternative A, and would result in the permanent disturbance of approximately two fewer acres. The habitat type most affected by this decreased acreage would be annual grassland. Despite the reduction in the number of acres affected, the total permanent loss and temporary disturbance of annual grassland and valley foothill riparian habitat resulting from construction of the Alternative B transmission line would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

The impacts of Alternative B on special-status wildlife species would be the same as described for Alternative A.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

In contrast to Alternative A, the shortened Alternative B transmission line would not extend to the Sacramento River and would not be located adjacent to the Delevan NWR. In addition, the shortened transmission line would reduce the potential for avian collision, when compared to Alternative A. However, the remaining risk of collision and the potential disruption of a migratory corridor associated

with the Alternative B transmission line would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Delevan Pipeline Discharge Facility

For Alternative B, the Delevan Pipeline would be operated as a release-only pipeline. The associated Delevan Pipeline Discharge Facility would, therefore, not include a fish screen or any of the facilities needed for pumping and generating operations that were described for Alternative A. The ground-disturbing activities associated with the construction of the Delevan Pipeline Discharge Facility would result in the direct and permanent loss of wildlife habitats (Table 14-22), but habitat loss would occur at a smaller scale than described for the Intake Facilities for Alternative A.

Table 14-22
Direct and Permanent Wildlife Habitat Loss Due to the Construction of the Delevan Pipeline Discharge Facility: Alternative B Compared to the Alternative A Delevan Pipeline Intake Facilities

Habitat	Permanent Loss (Acres) by Alternative A	Permanent Loss (Acres) by Alternative B
Canal	0.6	0.1
Deciduous orchard	11.1	3.9
Riverine	1.6	0.1
Urban/disturbed	4.2	2.0
Valley foothill riparian	1.6	1.6
TOTAL	19.1	7.7

Additional acreage of temporary disturbance would occur as a result of a construction disturbance area for these facilities. The construction disturbance area for the Delevan Pipeline would be located adjacent to these facilities and could potentially be used as a staging area. Disturbed areas would be restored to their original habitat type after construction is complete. The wildlife habitat that would be affected by this construction disturbance area would be deciduous orchard habitat.

Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS

The smaller proposed Delevan Pipeline Discharge Facility would result in the permanent loss of approximately 12 fewer acres of wildlife habitat than Alternative A. The habitat type most affected would be deciduous orchard. Despite the reduction in the number of acres affected, the total permanent loss of wildlife habitat resulting from construction of the Alternative B discharge facility would be a **significant impact**, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS

Construction of the proposed Delevan Pipeline Discharge Facility would result in the loss of approximately 140 linear feet (0.03 mile) of river bank, as compared to the loss of 660 linear feet (0.1 mile) associated with the Alternative A Intake Facilities. Despite the reduced Alternative B impact on

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the river bank, the number of acres of valley foothill riparian habitat that would be lost would be the same as described for Alternative A. This loss of river bank and riparian habitat would reduce the connectivity of the riparian corridor at this location, which could reduce the value of the habitat to the ringtail and western yellow-billed cuckoo. Despite the reduced number of acres of deciduous orchard habitat loss associated with Alternative B, the loss of this habitat, combined with the loss of riparian habitat, could adversely affect the western yellow-billed cuckoo. Despite the reduced size of the footprint of the Delevan Pipeline Discharge Facility, the shift in its location would result in the take of a second elderberry shrub that is located adjacent to the footprint of the Delevan Pipeline Intake Facilities and could adversely affect the valley elderberry longhorn beetle. Therefore, the Alternative B discharge facility would have a **potentially significant impact** on these special-status wildlife species, when compared to Existing Conditions and the No Project/No Action Alternative.

Impact Wild-3: Substantial Interference with the Movement of any Native Resident or Migratory Wildlife Species, or with Established Native Resident or Migratory Wildlife Corridors, or Impede the Use of Native Wildlife Nursery Sites

The valley foothill riparian habitat that exists along the banks of the Sacramento River provides a travel corridor for numerous terrestrial wildlife species, including the fully-protected ringtail. Gaps in the connectivity of this corridor create higher risks of predation for wildlife that have to travel through these areas. Therefore, the removal of 140 linear feet of valley foothill riparian habitat along the Sacramento River associated with construction of the proposed Delevan Pipeline Discharge Facility resulting from implementation of Alternative B would have a **potentially significant impact** on terrestrial wildlife, when compared to Existing Conditions and the No Project/No Action Alternative.

Summary of Alternative B Impacts to Wildlife Habitats

Construction, operation, and maintenance of Alternative B would result in the permanent loss of 15,508.3 acres, and the temporary disturbance of an additional 5,341.4 acres, of wildlife habitat (Table 14-23).

Table 14-23
Acres of Wildlife Habitat^a Subject to Alternative B Construction Impacts

Habitat Type	Acreage	
	Permanent Loss ^b	Temporary Disturbance ^c
Annual grassland	13,694.4	2,079.4
Barren	0.2	20.9
Blue oak woodland	887.5	644.3
Canal	8.6	13.5
Chamise-redshank chaparral	0.6	1.9
Deciduous orchard	8.2	174.0
Dryland grain and seed crops	331.2	213.0
Eucalyptus	0	46.2
Fresh emergent wetland	0.5	18.5
Irrigated row and field crops	155.6	225.7
Lacustrine	22.4	226.4
Mixed chaparral	0.8	1.8
Pasture	72.7	241.2
Rice	121.2	1,383.6
Riverine	0.1	0
Urban/disturbed	88.6	46.9
Valley foothill riparian	110.2	4.1
Valley oak woodland	3.5	0

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Table 14-23
Acres of Wildlife Habitat^a Subject to Alternative B Construction Impacts

Habitat Type	Acreage	
	Permanent Loss ^b	Temporary Disturbance ^c
TOTAL	15,508.3	5,341.4

^aCalculated acreage does not include acres associated with the Project Buffer because the location and extent of disturbance is not yet specified.

^bTotal permanent habitat loss acreage includes the footprint of Sites Reservoir and Dams, Sites Reservoir Inlet/Outlet Structure, Sites Pumping/Generating Plant, Sites Electrical Switchyard, Field Office Maintenance Yard, Holthouse Reservoir Complex, Holthouse Reservoir Electrical Switchyard, GCID Canal Connection to the TRR, TRR, TRR Pumping/Generating Plant, TRR Electrical Switchyard, TRR Pipeline Road, Delevan Pipeline Electrical Switchyard, and the Delevan Pipeline Discharge Facilities. Total permanent loss acreage also includes the estimated permanent loss from construction within the footprint of the Recreation Areas, within the construction disturbance area for the Road Relocations, and from construction of the transmission tower footings associated with the Delevan Transmission Line.

^cTotal temporary disturbance acreage includes the footprint of the Recreation Areas (minus the acreage of estimated permanent loss) and the footprint of the existing Funks Reservoir, as well as the defined construction disturbance areas for the Road Relocations (minus the acreage of estimated permanent loss), Delevan Pipeline, TRR Pipeline, Holthouse to T-C Canal Pipeline, TRR to Funks Creek Pipeline, Delevan Transmission Line, and GCID Canal Facilities Modifications. Total temporary disturbance acreage also includes the estimated construction disturbance areas (outside of the footprints) for Sites Reservoir and Dams, Sites Reservoir Inlet/Outlet Structure, Sites Pumping/Generating Plant, Tunnel from Sites Pumping Generating Plant to Sites Inlet/Outlet Structure, Sites Electrical Switchyard, Field Office Maintenance Yard, Holthouse Reservoir Complex, Holthouse Reservoir Electrical Switchyard, GCID Canal Modifications, GCID Canal Connection to the TRR, TRR, TRR Pumping/Generating Plant, TRR Electrical Switchyard, and Delevan Pipeline Discharge Facilities.

14.3.8 Impacts Associated with Alternative C

14.3.8.1 Extended Study Area – Alternative C

Construction, Operation, and Maintenance Impacts

The impacts associated with Alternative C, as they relate to wildlife habitat (**Impact Wild-1**), special-status wildlife species (**Impact Wild-2**), and wildlife movement (**Impact Wild-3**), as well as the potential impacts from human disturbance (**Impact Wild-4**), or conflicts with habitat plans (**Impact Wild-5**), would be the same as described for Alternative A for the Extended Study Area.

14.3.8.2 Secondary Study Area – Alternative C

Construction, Operation, and Maintenance Impacts

The impacts associated with Alternative C operations on wildlife habitat (**Impact Wild-1**), special-status wildlife species (**Impact Wild-2**), and wildlife movement (**Impact Wild-3**), as well as the potential impacts from human disturbance (**Impact Wild-4**), or conflicts with habitat plans (**Impact Wild-5**) would be the same as described for Alternative A for Lewiston Lake, Whiskeytown Lake, Keswick Reservoir, Lake Natoma, Thermalito Complex, Trinity River, Klamath River, Spring Creek, Clear Creek, Feather River, American River, Sacramento-San Joaquin Delta, Suisun Bay, San Pablo Bay, San Francisco Bay, and for the Sacramento River as it pertains to the construction, operation, and maintenance impacts associated with the pump installation at the Red Bluff Pumping Plant.

Because Alternative C includes the three Project intake locations that were described for Alternative A, the operational impacts associated with Alternative C, as they relate to wildlife habitat (**Impact Wild-1**), special-status wildlife species (**Impact Wild-2**), and wildlife movement (**Impact Wild-3**), as well as the potential impacts from human disturbance (**Impact Wild-4**), or conflicts with habitat plans (**Impact Wild-5**), would be the same as described for Alternative A for Trinity Lake, Shasta Lake, Lake Oroville, Folsom Lake, Sacramento River, Sutter Bypass, and Yolo Bypass.

14.3.8.3 Primary Study Area – Alternative C

Construction, Operation, and Maintenance Impacts

The following Primary Study Area Project facilities are included in Alternatives A, B, and C. These facilities would require the same construction, operation, and maintenance activities regardless of alternative, and would, therefore, result in the same construction, operation, and maintenance impacts to terrestrial biological resources:

- Recreation Areas
- Sites Pumping/Generating Plant
- Sites Electrical Switchyard
- Tunnel from Sites Pumping/Generating Plant to Sites Reservoir Inlet/Outlet Structure
- Sites Reservoir Inlet/Outlet Structure
- Field Office Maintenance Yard
- Holthouse Reservoir Complex
- Holthouse Reservoir Electrical Switchyard
- GCID Canal Facilities Modifications
- GCID Canal Connection to the TRR
- TRR
- TRR Pumping/Generating Plant
- TRR Electrical Switchyard
- TRR Pipeline
- TRR Pipeline Road
- Delevan Pipeline
- Delevan Pipeline Electrical Switchyard

The Delevan Transmission Line and Delevan Pipeline Intake Facilities included in Alternative C are the same as described for Alternative A. These facilities would require the same construction methods and operation and maintenance activities regardless of alternative, and would, therefore, result in the same construction, operation, and maintenance impacts to botanical resources as described for Alternative A.

The Alternative C design for the Sites Reservoir Inundation Area and Dams, Electrical Distribution Lines associated with the Recreation Areas, and Road Relocations and South Bridge are the same as described for Alternative B. These facilities would require the same construction, operation, and maintenance activities regardless of alternative, and would, therefore, result in the same construction, operation, and maintenance impacts to terrestrial biological resources as described for Alternative B.

The boundary of the Project Buffer is the same for Alternatives A, B, and C, but because the footprints of some of the Project facilities that are included in the Project Buffer would differ between the alternatives, the acreage of land within the Project Buffer would also differ. However, these differences in the size of the area included within the buffer would not change the type of construction, operation, and maintenance activities that were described for Alternative A.

Summary of Alternative C Impacts to Wildlife Habitats

Construction, operation, and maintenance of Alternative C would result in the permanent loss of 15,536.72 acres, and the temporary disturbance of an additional 5,329.4 acres, of wildlife habitat (Table 14-24).

Table 14-24
Acres of Wildlife Habitat^a Subject to Alternative C Construction Impacts

Habitat Type	Acreage	
	Permanent Loss ^b	Temporary Disturbance ^c
Annual grassland	13,694.7	2,091.5
Barren	0.2	21.4
Blue oak woodland	887.5	6443.
Canal	9.1	14.1
Chamise-redshank chaparral	0.6	2.1
Deciduous orchard	15.4	175.1
Dryland grain and seed crops	333.2	214.5
Eucalyptus	0	46.2
Fresh emergent wetland	0.5	18.5
Irrigated row and field crops	155.6	225.7
Lacustrine	22.4	226.6
Mixed chaparral	0.8	1.8
Pasture	72.7	241.2
Rice	122.9	1,383.6
Riverine	1.6	0
Urban/disturbed	90.8	46.9
Valley foothill riparian	110.2	4.1
Valley oak woodland	3.5	0
TOTAL	15,521.7	5,357.6

^aCalculated acreage does not include acres associated with the Project Buffer because the location and extent of disturbance is not yet specified.

^bTotal permanent habitat loss acreage includes the footprint of Sites Reservoir and Dams, Sites Reservoir Inlet/Outlet Structure, Sites Pumping/Generating Plant, Sites Electrical Switchyard, Field Office Maintenance Yard, Holthouse Reservoir Complex, Holthouse Reservoir Electrical Switchyard, GCID Canal Connection to the TRR, TRR, TRR Pumping/Generating Plant, TRR Electrical Switchyard, TRR Pipeline Road, Delevan Pipeline Electrical Switchyard, and the Delevan Pipeline Intake Facilities. Total permanent loss acreage also includes the estimated permanent loss from construction within the footprint of the Recreation Areas, within the construction disturbance area for the Road Relocations, and from construction of the transmission tower footings associated with the Delevan Transmission Line.

^cTotal temporary disturbance acreage includes the footprint of the Recreation Areas (minus the acreage of estimated permanent loss) and the footprint of the existing Funks Reservoir, as well as the defined construction disturbance areas for the Road Relocations (minus the acreage of estimated permanent loss), Delevan Pipeline, TRR Pipeline, Holthouse to T-C Canal Pipeline, TRR to Funks Creek Pipeline, Delevan Transmission Line, and GCID Canal Facilities Modifications. Total temporary disturbance acreage also includes the estimated construction disturbance areas for Sites Reservoir and Dams, Sites Reservoir Inlet/Outlet Structure, Sites Pumping/Generating Plant, Tunnel from Sites Pumping Generating Plant to Sites Inlet/Outlet Structure, Sites Electrical Switchyard, Field Office Maintenance Yard, Holthouse Reservoir Complex, Holthouse Reservoir Electrical Switchyard, GCID Canal Connection to the TRR, TRR, TRR Pumping/Generating Plant, TRR Electrical Switchyard, and Delevan Pipeline Intake Facilities.

14.4 Mitigation Measures

Mitigation measures are provided below and summarized in Table 14-25 for the impacts that have been identified as significant or potentially significant.

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**Table 14-25
Summary of Mitigation Measures for
NODOS Project Impacts to Terrestrial Biological Resources**

Impact	Associated Project Facility	LOS Before Mitigation	Mitigation Measure	LOS After Mitigation
Impact Wild-1: A Substantial Adverse Effect, Including Alteration of Habitat Suitability, on any Wildlife Habitat, Especially Riparian Habitat or Other Sensitive Natural Communities Identified in Local or Regional Plans, Policies, Regulations, or by DFG or USFWS	All Primary Study Area Project Facilities (construction)	Significant or Potentially Significant	Mitigation Measure Wild-1a: Implement a Combination of Habitat Protection, Enhancement, Restoration, or Conservation Easement Measures, in Consultation with USFWS	Less than Significant
	Sites Reservoir, Road Relocations, Sites Outlet Structure, Delevan Pipeline Intake/Discharge Facilities, Project Buffer (construction)	Potentially Significant	Mitigation Measure Wild-1b: Implement Bat Exclusion Measures Prior to Demolition of Existing Structures	Less than Significant
Impact Wild-2: A Substantial Adverse Effect, Including Mortality, Either Directly or Through Habitat Modifications, on any Species Identified as a Candidate, Sensitive, or Special-Status Species in Local or Regional Plans, Policies, or Regulations, or by DFG or USFWS				
Impact Wild-2a: Bald Eagle	Sites Reservoir and Dams (construction operation)	Significant	Mitigation Measure Wild-2a: Obtain Permit for Bald Eagle Nest Tree Removal, Remove Nest Tree Outside of Breeding Season, and Create Suitable Habitat	Less than Significant
Impact Wild-2b: Bank Swallow	Delevan/TRR Pipelines (construction)	Potentially Significant	Mitigation Measure Wild-2b: Implement Protective Actions to Prevent Bank Swallows from Nesting in the Cut Banks of Project Construction Trenches	Less than Significant
Impact Wild-2c: Giant Garter Snake	Delevan Pipeline, GCID Canal Facilities Modifications (construction)	Significant	Mitigation Measure Wild-2c: Conduct Pre-Construction Surveys for Giant Garter Snakes and Implement Protective Actions. Conduct Project Construction Activity Between May 1 and October 1 in Giant Garter Snake Habitat. Compensate for Temporary Disturbance of Habitat According to USFWS Guidelines	Less than Significant

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**Table 14-25
Summary of Mitigation Measures for
NODOS Project Impacts to Terrestrial Biological Resources**

Impact	Associated Project Facility	LOS Before Mitigation	Mitigation Measure	LOS After Mitigation
Impact Wild-2d: Golden Eagle	Sites Reservoir and Dams (construction), Recreation Areas (construction, operation, and maintenance)	Potentially Significant	Mitigation Measure Wild-2d: Implement Avoidance and Minimization Measures at Historic or Active Golden Eagle Nest Sites. Conduct Satellite Telemetry Studies Pre- and Post-Construction to Determine Territory Size. Prepare a Golden Eagle Protection Plan and a Golden Eagle Monitoring Plan. Mitigate for Loss of Annual Grassland Foraging Habitat	Significant and Unavoidable
Impact Wild-2e: Ringtail	Delevan Intake/Discharge Facilities (construction, operation, and maintenance)	Potentially Significant	Mitigation Measure Wild-2e: Implement Protective Actions to Minimize Impacts to the Ringtail, and Restore Connectivity of Riparian Corridor	Less than Significant
Impact Wild-2f: Valley Elderberry Longhorn Beetle	Sites Reservoir and Dams (construction), Road Relocations (construction, operation), Delevan Pipeline Intake/Discharge Facilities (construction)	Significant	Mitigation Measure Wild-2f: Implement Protective Actions to Avoid or Minimize Impacts to Elderberry Plants. Where Avoidance is not Possible, Transplant or Replace Plants, According to USFWS Guidelines	Less than Significant
Impact Wild-2g: Western Burrowing Owl	Sites Reservoir and Dams (construction), Road Relocations (construction, operation, and maintenance)	Potentially Significant	Mitigation Measure Wild-2g: Conduct Pre-Construction Surveys for Western Burrowing Owls. If Owls are Found, Implement Protective Actions	Less than Significant
Impact Wild-2h: Western Pond Turtle	Sites Reservoir and Dams (construction, operation), Holthouse Reservoir Complex (construction), Delevan Pipeline (construction)	Potentially Significant	Mitigation Measure Wild 2h: Conduct Pre-Construction Surveys and Provide a Biological Monitor During Project Construction for the Western Pond Turtle. If Found, Turtles shall be Captured and Relocated by a Qualified Biologist	Less than Significant
Impact Wild-2i: Yellow-Billed Cuckoo	Delevan Pipeline Intake/Discharge Facilities (construction)	Potentially Significant	Mitigation Measure Wild-2i: Conduct Pre-Construction Surveys for the Western Yellow-Billed Cuckoo and Schedule Construction Activities to Avoid Impacts to Nest Sites	Less than Significant

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Table 14-25
Summary of Mitigation Measures for
NODOS Project Impacts to Terrestrial Biological Resources

Impact	Associated Project Facility	LOS Before Mitigation	Mitigation Measure	LOS After Mitigation
Impact Wild-3: Substantial interference with the movement of any native resident or migratory wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites	Delevan Pipeline (construction), Delevan Transmission Line (construction and operation), Delevan Pipeline Intake/Discharge Facilities (construction)	Potentially Significant	Mitigation Measure Wild-3a: During Project Construction, Backfill Trenches within 72 hours of Pipeline Installation and Provide an Escape Ramp for Trapped Wildlife Mitigation Measure Wild-3b: Construct Transmission Lines and Associated Equipment Following Suggested Practices for Avian Protection on Power Lines Mitigation Measure Wild-3c: Restore Riparian Habitat Connectivity	Less than Significant
Impact Wild-4: Indirect effects on common wildlife from human disturbance	All Primary Study Area Project Facilities (construction, operation, and maintenance)	Potentially Significant	Mitigation Measure Wild-4: Implement Avoidance and Minimization Measures.	Less Than Significant

Note:

LOS = Level of Significance

Mitigation Measure Wild-1a: Implement a Combination of Habitat Protection, Enhancement, Restoration, or Conservation Easement Measures, in Consultation with USFWS

For all three action alternatives, the acreage of permanent habitat loss within the Recreation Areas and the Road Relocations, as well as the temporary habitat disturbance within the construction disturbance areas for most facilities, was estimated. Because these acres are estimated, it may be possible to avoid impacts to certain habitat types.

A Habitat Evaluation Procedures assessment of the Primary Study Area was conducted under the lead of USFWS. A determination of appropriate mitigation measures for the habitat types that would be adversely affected within the Primary Study Area shall be made using the results of the HEP assessment, as well as through consultation with USFWS pursuant to the Fish and Wildlife Coordination Act. Mitigation measures could include but not be limited to protection, enhancement, restoration, or conservation easement.

Mitigation Measure Wild-1b: Implement Bat Exclusion Measures Prior to Demolition of Existing Structures

Prior to structure demolition, structures shall be inspected by a qualified biologist to determine if bats are present, and if present, to determine if the structure is being used as a day, night, or maternity roost. If a roost is present, appropriate bat exclusion measures shall be implemented at least five to seven days prior to structure demolition outside of the maternity season, which can range from mid-April through August 31, and outside of the winter months when bats could be hibernating. Bat exclusion measures could include one-way devices such as polypropylene netting, plastic sheeting, or tube-type excluders that

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would be placed at all active entry points. If a roost is present in a structure located outside of a reservoir inundation area, possible avoidance measures could include retaining the structure.

Mitigation Measure Wild-2a: Obtain Permit for Bald Eagle Nest Tree Removal, Remove Nest Tree Outside of Breeding Season, and Create Suitable Habitat

A permit to remove or relocate an eagle nest shall be obtained from USFWS. The bald eagle nest tree shall be removed outside of the breeding season, which ranges from January through July, to avoid direct impacts. Dam construction activities shall not occur during the breeding season until the nest tree is removed. After construction is complete, the filling of Sites Reservoir and Holthouse Reservoir would create new fish-bearing lacustrine habitat in an area that is surrounded by suitable bald eagle nest trees. Following inundation, releases downstream of Golden Gate Dam would restore flows to Funks Creek to maintain fisheries and bald eagle habitat.

Mitigation Measure Wild-2b: Implement Protective Actions to Prevent Bank Swallows from Nesting in the Cut Banks of Project Construction Trenches

Construction of the pipelines shall begin in May due to giant garter snake restrictions. May falls within the bank swallow breeding season (ranging from mid-March through July). Protective action shall be taken to prevent bank swallows from attempting to nest within the cut banks of the pipeline trenches. Actions shall include the placement of a mesh net on all cut banks during the bank swallow nesting season, and implementation of **Mitigation Measure Wild-3a** to ensure that trenches are backfilled within 72 hours of pipeline installation.

Mitigation Measure Wild-2c: Conduct Pre-Construction Surveys for Giant Garter Snakes and Implement Protective Actions. Conduct Project Construction Activity Between May 1 and October 1 in Giant Garter Snake Habitat. Compensate for Temporary Disturbance of Habitat According to USFWS Guidelines

Protective actions shall be taken to avoid or minimize impacts to the giant garter snake. Protective actions and mitigation measures shall comply with the USFWS's Programmatic Biological Opinion (USFWS, 1997) and could include the following actions:

- Preconstruction surveys shall be conducted within 24 hours prior to the start of construction in giant garter snake habitat. If a snake is encountered during construction, activities shall cease until corrective measures have been completed. Any sightings shall be reported to USFWS.
- Exclusion fencing shall be placed around construction areas within giant garter snake habitat to ensure that snakes do not enter the area. Exclusion fencing shall also be used around any agricultural irrigation ditches within 200 feet of the disturbance area.
- Construction activity within giant garter snake habitat shall be conducted between May 1 and October 1. If work outside of this time period is necessary, USFWS's Sacramento Fish and Wildlife Office shall be contacted to determine which additional protection measures are necessary.
- Construction personnel shall receive USFWS-approved environmental awareness training so that workers can recognize giant garter snakes and their habitats.
- Clearing shall be confined to the defined construction disturbance area.

- Rice fields shall be fallowed prior to the start of construction, and any dewatered habitat shall remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling of the dewatered habitat.
- Construction between May and September in wetlands shall be restricted to prevent inadvertent mortality of giant garter snakes.
- A trained biological monitor shall be onsite during construction activities to inspect around the work equipment and within the trench and surrounding disturbance area each day before work begins.
- **Mitigation Measure Wild-3a** shall be implemented to avoid potential entrapment of a snake in the pipeline trench.
- After construction is complete, habitat shall be restored to pre-Project conditions.

Temporary disturbance to giant garter snake habitat would typically be mitigated at a ratio of 1:1. However, construction activity for the Delevan Pipeline is scheduled to occur during three giant garter snake seasons (season is from May 1 through October 1). Any disturbance lasting longer than two seasons is considered to be a permanent loss of habitat and shall be mitigated at a ratio of 3:1, with some of the mitigation compensated for through restoration of the area after Project construction is complete. If Project construction is conducted outside of the May 1 through October 1 active season, mitigation at a ratio of 6:1 could be required.

Disturbance to fresh emergent wetland habitat could, and shall to the extent feasible, be avoided by reducing the use of the construction buffer in areas of this habitat type, or altering the footprint of the road. Mitigation for rice habitat would already be partially compensated for by implementation of the mitigation for loss of wildlife habitat types described above.

Mitigation Measure Wild-2d: Implement Avoidance and Minimization Measures at Historic or Active Golden Eagle Nest Sites. Conduct Satellite Telemetry Studies Pre- and Post-Construction to Determine Territory Size. Prepare a Golden Eagle Protection Plan and a Golden Eagle Monitoring Plan. Mitigate for Loss of Annual Grassland Foraging Habitat

Golden eagle nests were observed within the footprint of three of the five proposed Recreation Areas during field surveys. Subsequent surveys documented that the nest at Lurline Headwaters Recreation Area no longer exists, the nest at Peninsula Hills Recreation Area is still active, and the nest at Stone Corral Recreation Area is falling apart, but is still active. An active golden eagle nest also exists outside, but in the vicinity, of the Sites Dam footprint.

Construction activities shall be modified to ensure that nesting golden eagles are protected. To avoid impacts to nesting golden eagles at Peninsula Hills, construction of the recreation area would be deferred. To avoid or minimize possible impacts to nesting golden eagles in other construction areas, some or all of the following measures shall be implemented:

- A bird detraction program shall be implemented near historic golden eagle nest sites to discourage eagles from returning to those sites.
- Construction near recently active nest sites shall start outside the active nesting season. The nesting period for golden eagles is between March 1 and August 15.

- If groundbreaking activities begin during the nesting period, a qualified biologist shall perform a pre-construction survey 14 to 30 days before the start of each new construction phase to search for golden eagle nest sites in appropriate habitat within 0.5 mile of proposed activities. If active nests are not identified, no further action is required and construction may proceed.
- If active nests are identified, a minimum 0.5 mile buffer zone around active golden eagle nests shall be implemented. Buffer zones shall remain until young have fledged. For activities conducted with agency approval within this buffer zone, a qualified biologist shall monitor construction activities and the eagle nest(s) to monitor eagle reactions to activities. If activities are deemed to have a negative effect on nesting eagles, the biologist shall immediately inform the construction manager that work should be halted, and CDFG and USFWS will be consulted.
- For golden eagles that begin nesting within the buffer zone after start of construction, the same avoidance and minimization measures as described for active eagle nests found before start of construction (0.5 mile buffer) shall be implemented. A buffer of less than 0.5 mile may be used if there is a visual barrier, such as a hill or dense trees, between the construction activity and the nest.

After construction is complete, it is possible that golden eagles will nest within the constructed Recreation Areas. In this situation, the following avoidance and minimization measures shall be implemented:

- After construction, golden eagle nesting sites shall be surveyed and monitored within and adjacent to the Recreation Areas to ensure that recreational activities do not disrupt eagle nest sites. Surveys shall be performed at the beginning of, and continue through, the nesting season. Consistent with avoidance guidelines, recreational access and other disruptive activities shall be suspended within 0.5 mile of active golden eagle nests until the young eagles have fledged.

The filling of Sites Reservoir would result in the loss of more than 11,600 acres (Alternative A) and almost 13,200 acres (Alternatives B and C) of annual grassland that provides foraging habitat for golden eagles. To assess the impact of this loss of foraging habitat, the following measures shall be implemented prior to the start of Project construction:

- A Golden Eagle Monitoring Plan shall be prepared.
- Satellite telemetry studies shall be conducted for three to five years prior to the start of construction to establish the number of golden eagles and the size of their territories.
- Surveys shall be conducted by permitted biologists.
- A Golden Eagle Protection Plan shall be prepared.

After construction is complete, at least five years of telemetry studies (to be determined during consultation with USFWS) shall be conducted to determine the effect of habitat loss. The loss of the annual grassland habitat shall be mitigated during consultation with USFWS; mitigation may include the preservation of annual grassland habitat located near the Primary Study Area that could provide foraging habitat for golden eagles, or could consist of restoring a historic foraging site that is no longer used because of an impact.

Mitigation Measure Wild-2e: Implement Protective Actions to Minimize Impacts to the Ringtail, and Restore Connectivity of Riparian Corridor

The fully-protected ringtail was observed within the riparian habitat that would be removed during construction of the Delevan Pipeline Intake/Discharge Facilities. The removal of riparian habitat within the footprint of the facilities would further reduce connectivity of the riparian corridor at that location. Implementation of **Mitigation Measure Wild-3c** would restore that connectivity. To minimize potential direct impacts to the ringtail, riparian vegetation removal shall not occur during the early pup-rearing season, which ranges from May 1 through June 15. Efforts to restore riparian corridor connectivity could include other habitat enhancements, such as providing ringtail nesting cavities and planting food sources.

Mitigation Measure Wild-2f: Implement Protective Actions to Avoid or Minimize Impacts to Elderberry Plants. Where Avoidance is not Possible, Transplant or Replace Plants, According to USFWS Guidelines

There are two elderberry shrubs located within the potential construction disturbance area for Sites Reservoir and Dams that could be completely avoided by establishing and maintaining a 100-foot-wide or wider buffer around them. Construction crews shall be briefed regarding the need to avoid these plants, and signs shall be posted during construction to avoid the buffer area. After Project construction is complete, this area would not be affected by Project operation or maintenance.

The elderberry shrub immediately adjacent to the footprint of the Delevan Pipeline Intake/Discharge Facility is located on the edge of an irrigation canal that is situated along an existing access road. Because of its proximity to the road, it would not be possible to establish a 100-foot-wide buffer. It would also not be possible to establish a 100-foot-wide buffer for the shrubs located immediately adjacent to the existing Maxwell Sites Road. Consultation with USFWS would be initiated for possible approval to encroach on the buffer. Otherwise, appropriate mitigation measures shall be implemented.

The elderberry shrubs within the footprint of Sites Reservoir, Sites Dam, and Golden Gate Dam, as well as the one shrub within the footprint of the Delevan Pipeline Intake/Discharge Facility, would not be avoided by Project construction, and therefore, shall be transplanted or replaced, depending on the likelihood of survival post-transplantation. Transplantation procedures shall comply with USFWS's 1999 Conservation Guidelines for the Elderberry Longhorn Beetle (USFWS, 1999b). If transplantation is not feasible, USFWS general guidelines require replacement of elderberry plants in designated mitigation areas. Elderberry plants are typically replaced at a ratio of 2:1 for stems greater than one inch in diameter at ground level with no adult emergence holes, 3:1 for stems where emergence holes are documented in less than 50 percent of the shrubs, and 5:1 for stems greater than one inch in diameter with emergence holes.

Mitigation measures already required for the loss of riparian habitat pursuant to the mitigation for loss of wildlife habitat types described above could potentially compensate for the native planting requirement for elderberry plant mitigation.

Mitigation Measure Wild-2g: Conduct Pre-Construction Surveys for Western Burrowing Owls. If Owls are Found, Implement Protective Actions

Pre-construction surveys shall be conducted in annual grasslands within the footprint of Sites Reservoir and within the construction disturbance area of the Road Relocations to determine if burrowing owls are present. These surveys shall be conducted within 30 days of ground-disturbing construction activities or

the start of the filling of reservoir. Surveys shall be conducted by a qualified biologist in compliance with the Burrowing Owl Survey Protocol and Mitigation Guidelines (CBOC, 1993). If burrowing owl burrows are found, protective measures shall be implemented.

Protective measures may include avoidance of occupied burrows during the nesting season, which is from February 1 through August 31, with the peak of the season occurring from April 15 through July 15. Any unoccupied burrows located within the immediate construction area shall be excavated using hand tools, and then filled to prevent reoccupation.

If destruction of occupied burrows is unavoidable, such as within the footprint of Sites Reservoir, burrow entrances shall be altered, outside of the nesting season, to allow resident owls to exit but not re-enter the burrow. Owls shall be excluded from burrows by installing one-way doors in burrow entrances. One-way doors shall be left in place for at least 48 hours to ensure owls have left the burrow before the start of construction. Other possible mitigation could include the creation of artificial burrows in adjacent suitable habitat.

Loss of annual grassland habitat shall be compensated for with implementation of the mitigation for loss of wildlife habitat types described above.

Mitigation Measure Wild-2h: Conduct Pre-Construction Surveys and Provide a Biological Monitor During Project Construction for the Western Pond Turtle. If Found, Turtles shall be Captured and Relocated by a Qualified Biologist

Before construction activities begin, a qualified biologist shall conduct western pond turtle surveys along creeks and other ponded areas within the footprint of Sites Reservoir, Sites Dam, and Holthouse Reservoir, as well as along the irrigation canals within the construction disturbance area of the Delevan Pipeline. Adjacent upland areas shall also be examined for evidence of nests or individual turtles. A Project biologist shall be responsible for conducting the survey and relocating any turtles found within footprints or construction disturbance areas. If a nest is observed, a biologist with appropriate permits and prior approval from CDFG shall move eggs to a suitable location or facility for incubation. However, some individuals may be undetected or enter sites after surveys are conducted, and could be subject to mortality. A biological monitor shall, therefore, be present during Project construction to minimize take.

Mitigation Measure Wild-2i: Conduct Pre-Construction Surveys for the Western Yellow-Billed Cuckoo and Schedule Construction Activities to Avoid Impacts to Nest Sites

The yellow-billed cuckoo breeding season ranges from mid-June through August. To minimize direct impacts to this species, riparian and orchard vegetation removal within the footprint of the Delevan Pipeline Intake/Discharge Facility shall occur outside of these dates. If construction activities are scheduled to occur during the breeding season, preconstruction surveys shall be conducted in riparian and orchard habitat within the construction disturbance area of the Delevan Pipeline Intake/Discharge Facility to confirm that cuckoos are not actively nesting in or near the area. If active nests are identified, a minimum 500-foot construction buffer shall be established around any nest sites. All construction shall be avoided where active nests are discovered until the cuckoos have finished nesting.

Loss of valley foothill riparian and deciduous orchard habitat shall be compensated for with implementation of the mitigation for loss of wildlife habitat types described above.

Mitigation Measure Wild-3a: During Project Construction, Backfill Trenches within 72 hours of Pipeline Installation and Provide an Escape Ramp for Trapped Wildlife

Pipeline trenches shall be backfilled within 72 hours of pipeline installation to prevent potential impacts to trapped wildlife. The trench shall be inspected for wildlife before it is filled. At the end of each day, a ramp shall be placed at the end of the trench at an approximate 45 degree slope to allow trapped wildlife to escape. In addition to a ramp, the trench shall be covered to prevent wildlife from falling in.

Mitigation Measure Wild-3b: Construct Transmission Lines and Associated Equipment Following Suggested Practices for Avian Protection on Power Lines

Transmission lines, poles, and associated equipment shall be properly fitted with wildlife protective devices to isolate and insulate structures to prevent injury or mortality to wildlife, especially avian species. Protective measures shall follow the guidelines provided in Suggested Practices for Avian Protection on Power Lines (APLIC, 2006), and shall include insulating hardware or conductors against simultaneous contact, using poles that minimize impacts to birds, and increasing the visibility of conductors or wires to prevent or minimize bird collisions.

Mitigation Measure Wild-3c: Restore Riparian Habitat Connectivity

After the Delevan Pipeline Intake/Discharge Facilities are constructed, riparian habitat connectivity shall be restored to provide a travel corridor for terrestrial wildlife. The entire length of the land side of the new levee associated with the facilities shall be planted with riparian vegetation. Where the levee approaches SR 45, fencing shall be installed to protect wildlife from vehicles. Vegetation shall be monitored, and irrigated if necessary, to ensure survival.

Mitigation Measure Wild-4: Implement Avoidance and Minimization Measures

Measures to avoid or minimize human disturbance impacts associated with Project construction and maintenance activities shall include the following:

- Provide worker awareness training to all construction personnel prior to the start of construction activities; such training shall explain how to avoid impacts to sensitive species or habitats.
- Require construction personnel to comply with applicable federal, State, and local laws and regulations regarding prevention and control of noise during Project construction.
- Equip construction equipment engines with adequate mufflers, intake silencers, and engine enclosures.
- Turn off construction equipment during prolonged periods of nonuse to eliminate noise.
- Maintain all equipment appropriately, and train equipment operators regarding good practices to reduce noise levels.
- Minimize light pollution to the greatest extent practicable. Measures may include, but not be limited to, light hoods/shields, directional lighting, or minimum required brightness.
- Conduct pre-construction surveys in habitat types for special-status species. If found, protective actions shall be taken to passively relocate wildlife as needed.

- Use exclusion fencing or equivalent to prevent wildlife from entering the Project construction area. Fencing shall be removed after construction is complete.
- A biological monitor shall be on-site during Project construction in habitat associated with special-status species.
- Removal of trees and other vegetation shall occur outside of the breeding/nesting season of associated special-status species, and shall be completed prior to the start of reservoir filling to minimize impacts to tree- or shrub-nesting species. If Project construction must occur during the breeding/nesting season, a USFWS or DFG-approved buffer shall be established around the sensitive areas.
- Demolition of structures and bridge maintenance shall occur outside of the breeding/roosting season. If Project construction or maintenance must occur during this period, exclusionary devices shall be installed during late fall or winter to prevent roosting in structures.
- Maintenance of transmission lines or towers shall not be conducted during the nesting season in proximity to an active raptor nest.
- Food-related garbage items, such as wrappers, cans, bottles, or food scraps, shall not be left at the Project construction sites.
- Persons associated with the Project shall not be permitted to have pets of any kind within the Project construction sites.

Measures to avoid or minimize human disturbance impacts associated with Project recreation activities shall include the following:

- Implement adequate signage, fencing, and leash laws in areas of public access to minimize potential harassment of wildlife, including handling, by people and pets.
- Retain or plant screening vegetation along the margins of developed areas to reduce indirect impacts from lights and noise and the effects of human disturbance.
- Retain mature trees and minimize use of non-native landscaping.
- Design recreational areas with physical barriers to limit impacts to adjacent habitat.
- Revegetate areas of disturbed soil.
- Establish boat speed limits and designate no wake zones in sensitive areas to minimize disturbance of lacustrine wildlife and erosion of shoreline habitat.
- Provide adequate numbers of wildlife-proof garbage containers and maintain a pick-up schedule of at least once per week during the recreation season.
- For exterior lighting, use light shields or downward directed lighting to minimize the impacts of artificial light.

Measures to avoid or minimize impacts from human disturbance impacts associated with increased traffic during Project construction shall include the following:

- Restrict all movement of construction vehicles outside of the right-of way to pre-designated access or public roads.

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- Enforce an approved speed limit on Project right-of way and access roads, unless otherwise posted, for all Project personnel.

Implementation of **Mitigation Measures Wild-1a, Wild-1b, Wild-2a, Wild-2b, Wild-2c, Wild-2e, Wild-2f, Wild-2g, Wild-2h, Wild-2i, Wild-3a, Wild-3b, Wild-3c, and Wild-4** would reduce the level of significance of Project impacts to **less than significant**.

Implementation of **Mitigation Measure Wild-2d** would result in Project impacts remaining **significant and unavoidable**.

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